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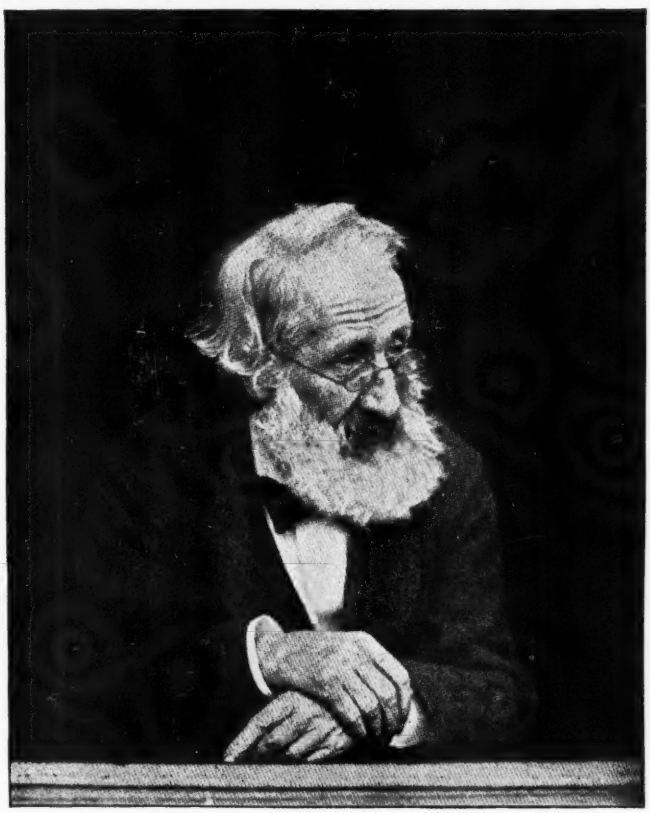

SIR JOHN TOMES, F.R.S., F.R.C.S., L.D.S., ENGLAND

(1815-1895)

Principal Works:

Lectures on Dental Physiology and Surgery, London, 1848.
A System of Dental Surgery, London, 1859.

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ORIGINAL ARTICLES

A BRIEF REVIEW OF CERTAIN HISTOLOGICAL AND ETIOLOGICAL FACTORS IN THE TREATMENT OF MALOCCLUSION.*

BY CLINTON C. HOWARD, D.D.S.
Professor of Orthodontia, Southern Dental College, Atlanta, Ga.

THE advancement of orthodontia as a science has been so rapid in the past decade that few general practitioners know how to treat malocclusion by the most scientific methods. Up to the time that the conditions of normal occlusion were thoroughly understood, and until the importance of this science was emphasized, there was some justification for the use of empirical methods both in diagnosis and treatment. But at the present time it is astonishing to observe the methods of practitioners who do not appreciate the importance of normal occlusion. It does not suffice, however, to only accomplish the normal placement of each relative incline plane in molar, bicuspid and incisor region; there are still certain obscure principles to be observed in order to produce the desired results. These principles concern the physiological reproduction of bone induced by a given pressure.

Orthodontia has been classified as a distinct science, the practice of which requires a knowledge of living bone tissue and its responsiveness to mechanical stimulation just as the practice of medicine demands on the part of the physician a familiarity with the use of drugs and their *physiological* effects.

Histological Laws Must be Observed.

The earliest writers on the subject of orthodontia touched lightly upon the histological side of treatment in malocclusion. It was left for Noyes, who attached special importance to the correct manipulation of appliances, and, later, for Oppenheim of Vienna, to develop this phase of the science. The latter proved Noyes' theories by performing experiments on monkeys, animals closely akin to man in anatomical structure. Both of these authorities held that living bone tissue is plastic by nature, and at all times susceptible of structural re-arrangement brought about by mechanical stimulation. In short, "Bone will grow in any direction according to the character of pressure to which it is subjected."

*Lecture from Alabama Dental Transactions, Session 1914.

That you may understand the importance of this natural law, observe in Fig. 1 at K the arrangement of the spicules, or bone plates, in their relation to the roots of the teeth. It is clearly discernible that they lie parallel to the long axis of the root. Since this is a normal specimen, that is, one to which no artificial pressure has been applied, some natural stimulant or pressure must have induced their growth in that direction. From this fact then—that bone growth is influenced by *natural* pressure, we draw the conclusion that it may, in the same way, be influenced by *artificial* pressure. If you will recall that in every tooth development the eruptive force is created by cell multiplication in the root formation, which causes the crown of the embryo tooth to push upward through its crypt, you will understand the position of the spicules relative to the root at K.

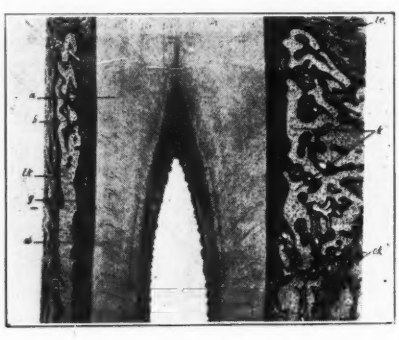


Fig. 1

In Fig. 1 is shown the normal microscopical structure of the alveolus in order to compare it with the same structure after the application of artificial pressure. The above section was cut from labial to lingual, showing a cross-section of labial compact bone and cancellous structure on the lingual.

Fig. 2 represents the labial compact bone plate after forty days of applied mechanical stimulation. In comparison with the labial plate in Fig. 1, notice the complete change resulting from physiological pressure. Observe the direction to which the spicules at Ki point. The pressure was directed labially, causing, in consequence, a new growth of bone to develop in that direction as indicated by these newly-formed "buds." Had physiological pressure been continued for from eighty to one hundred and twenty days, the bone already formed would again have been resorbed; the tooth would have occupied the place now filled by the bone, and the further bone growth would have occupied a proportional labial position.

Figs. 3 and 4 illustrate the same unvarying principle, the field here being at the apex of the root. Fig. 3 is a normal specimen; Fig. 4 shows a specimen after an application of a stimulus in an upward direction. Note the direction the spicules point, illustrating again the law of bone growth.

Thus the phenomena of bone reproduction continue, if the bone is physiologically stimulated. But if the pressure should be unphysiological, what would be the response? Fig. 5 shows the labial compact bone after a thirty days' pressure of such severity that circulation was disturbed, and, in consequence, cell metabolism; hence, as the figure shows, the labial plate is bent but not otherwise changed. There is no budding process apparent.

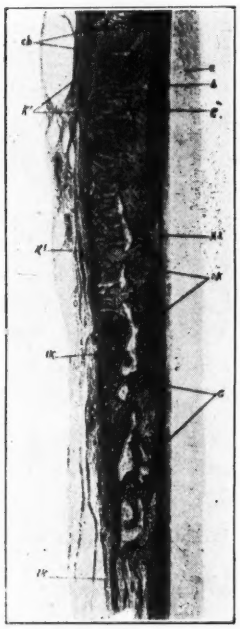


Fig. 2.

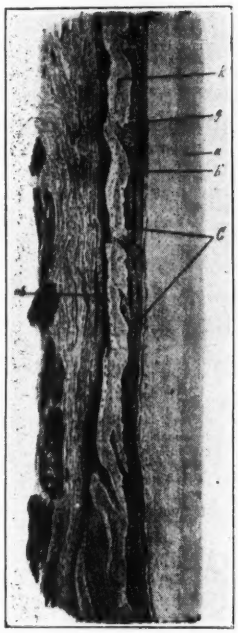


Fig. 5.

Fig. 2.—Labial movement; labial side; at *ob* near the alveolar border; the compact bone has disappeared and is replaced by spongy bone, with orientiation of the spicules vertically to the long axis of the tooth. Between *G* and *ok* transitional zone.

a dentine; *b* cementum; *g* peridental membrane; *G* blood vessels; *l.k.* compact bone of lamellated structure; *ok* osteoclasts; k^1 new formed bony spicules beset with osteoblasts (*ob*); k^2 remains of compact bone, that has lost already the lamellated structures.

Fig. 5.—Labial movement; labial side; application of intense force.

The compact bony plate (*k*) throughout somewhat attenuated; no architectural construction; all vessels of the peridental membrane (*G*) filled up with homogeneous masses (thrombosis?) *a* dentine; *b* cementum; *g* peridental membrane; *ob* osteoblasts in sporadic layers.

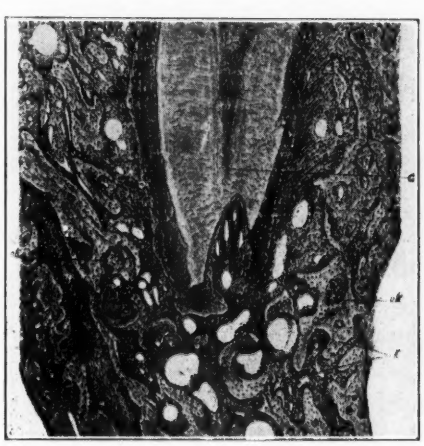


Fig. 3.

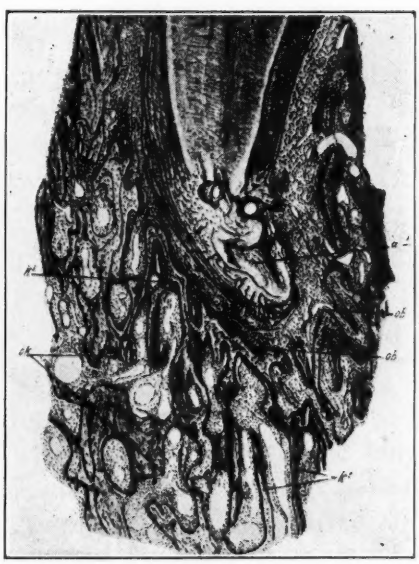


Fig. 4.

Fig. 3.—Region of the root apex; normal side. *a* tooth; *k* bone; *ok* osteoclasts.

Fig. 4.—Elongation; apex at the root k^1 in the direction of the pull orientiated long bone spicules, at their tops, looking towards the apex; enclosed by strong layers of osteoblasts (ob); *a* root apex; *ok* osteoclasts.

Any tooth movement accomplished by this method would not be permanent, for "lifeless" bone is elastic.

It might be asked how an orthodontist is to know the exact degree of pressure necessary to produce a normal reconstruction. Undue pressure disturbs circulation, and disturbed circulation is immediately followed by inflammation and pain which is our best danger signal. When a patient complains of soreness, the operator should know that this soreness is the result of unscientific manipulation of his appliances, and that if he continues this manipulation he will defeat the object of his treatment, which is the development of the bony structure in which the teeth are imbedded.

It might be supposed that a gentle, painless pressure would require more time to accomplish desired results than a pressure accompanied by pain, but the reverse is true. This I know from my own experience. My patients soonest cured were those who never complained of sore teeth. To quote again from Noyes: "If pressure is applied to a tooth which fails to respond by movement, decrease your pressure." In other words, to avoid hyperemia, always let your pressure be consistent with the natural physiological laws, in this way only will you incite osteogenesis.

Histological Laws Determining the Principle of Retention.

In retention we are also governed to a degree by the "law of bone growth." Assuming that any given case has been perfectly restored to a state of normal occlusion, it remains a necessity to apply less delicate appliances, that the teeth may be resisted in their inclination to relapse. First, tha the soft parts surrounding the arches, as the lips, cheeks and tongue, might assume normal functions, for it is upon the normal muscular action of these parts that we positively depend as our permanent and ultimate retention. Second, were it possible to move teeth with that degree of accuracy which would only promote a complete and perfect reproduction of new bone, retentive appliances would be, in many cases, unnecessary. However, even with the greatest care our application of forces far exceeds physiological tolerance, therefore, on the completion of active treatment, the new bone structure surrounding the roots is insufficient to maintain their new positions. It is concerning the character of retentive appliances which involve the *principle* of retention, upon which principle positively depends the efficiency of same, that I would have you understand. Briefly, it may be defined as an appliance which not only "resists the teeth in the direction to which they are inclined to return," but also to liberally permit each tooth a freedom of natural movement under the stresses of mastication. Again our histological knowledge most forcibly substantiates this apparently insignificant *principle*—bone will reproduce if mechanically stimulated.

I have known cases where the cuspids and incisors were banded, the bands *connected by solder*, and held in place by cement. On the removal of this unscientific retentive appliance, even after it had been worn for a long time, the teeth, to the surprise of the unskilled operator, rapidly resumed their original position.

The orthodontist who confines his treatment to mechanical appliances is as unsuccessful as a surgeon whose knowledge is confined solely to knife manipulation.

Etiology of Malocclusion.

Before discussing the causes of malocclusion, I shall call your attention to the impossibility of treating adequately this subject. A casual exposition of only one of the causes of malocclusion would require a paper of great length; hence it is my purpose to interpret only certain common conditions, produced by definite causes.

Early Loss of Deciduous Molars.

The value of deciduous molars in mastication is universally recognized by the profession, and such knowledge warrants an urgent appeal to parents for their preservation. Aside, however, from this particular function their presence in the arches up to the time of natural exfoliation, destines the

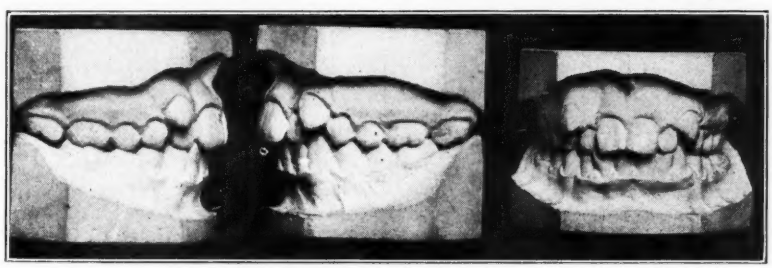


Fig. 6.—Before treatment.

Fig. 7.

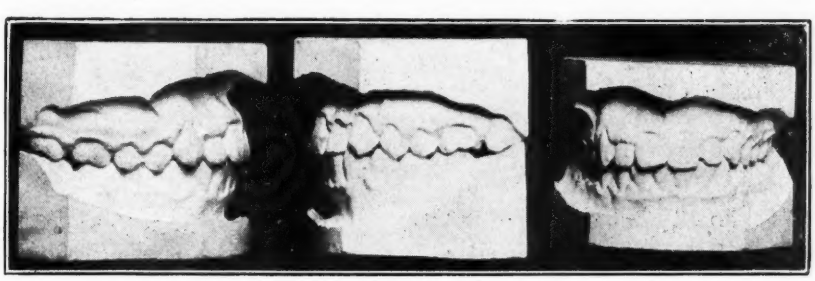


Fig. 8.—After treatment.

normal eruption and placement of the permanent teeth. Nor should we be concerned only with their actual presence, but equally so with their normal contour, which is so frequently destroyed by approximal cavities, for it is in either instance the function of contact-point which predestines normal or malocclusion of the permanent teeth.

Fig. 6 represents a malocclusion of the permanent teeth caused by the

early loss of the upper deciduous molars. It is easy to see that the molars and bicuspids are mesial in their relation to the lower teeth. Such malrelations were present before the eruption of the permanent cuspids; in fact, their mesial migrations consumed all the space necessary for the cuspids, hence their labial eruption. Viewing this condition from an etiological standpoint, you will observe in Fig. 7 that the six-year molars erupt posterior to and in contact with the deciduous ones. After the loss of a deciduous member, there is no controlling factor to effect the natural mesial migration of the permanent molar; hence it follows that the bicuspids will erupt mesial to normal, or in proximity to the lateral incisors, allowing no room for the eruption of the cuspids at the age of twelve.

From the above analysis, a correct diagnosis, which must ever precede correct treatment, is made simple. Fig. 8 presents case after molars and bicuspids were shifted distally to normal occlusion, thereby permitting the symptom (cuspids), and not the true condition, to assume the normal. Permit me to remind you that many such cases have suffered extraction, which disastrous decision could be prompted only by a misconception of the true condition. An explanation for such conditions have also been attributed to inheritance—the small jaw of the mother and large teeth of the father.

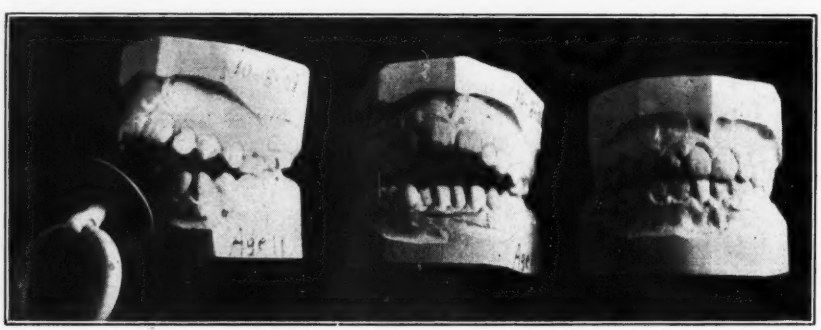


Fig. 9.

Habits.

Since the living bone is plastic, it can be readily understood that a gentle yet constant pressure of the thumb or finger, of a pacifier, rubber nipple, or even of the lip, cheek, or tongue may retard the development of the arches, or distort them; and the maldevelopment will be in proportion to the pressure.

Fig. 9* shows a condition directly caused by the pacifier. The pernicious habit of allowing babies to use pacifiers is permitted by many physicians whose attention has never been called to the evil results of this practice. Sucking the thumb, biting, or sucking the lower lip, or constantly holding the tongue between the anterior teeth will produce the same result shown in Fig. 9. A word of caution is necessary where there is a suspicion of such habits: the orthodontist should be sure these practices are discontinued, otherwise relapse will follow. Angle calls our attention to the fact that the habit of biting the lip, sucking in the cheeks, or any one of the many

*The illustration for Fig. 9 was kindly lent the author by Dr. James D. McCoy, of Los Angeles. All histological illustrations were taken from Dr. Albin Oppenheim's (of Vienna) treatise on bone, as published in *The American Orthodontist.*

kinds of tongue habit, is often hard to detect, and even harder to break. It is probable that the child with such habits is himself unconscious of them, manifesting in this way excitement or a remote nervous affection.

Nasal Obstructions (Adenoids).

Although it is an accepted fact by both orthodontists and rhinologists that a hypertrophy of the pharyngeal tonsils, commonly known as adenoids,

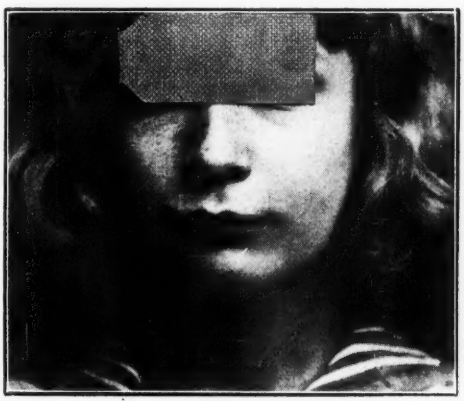


Fig. 10.

Fig. 11.

Fig. 10.

Fig. 11.

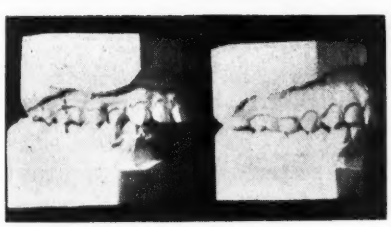


Fig. 10. Fig. 11.

will produce a malformation of the superior and inferior maxillæ and adjacent parts, still there seems to be a vagueness on the part of the rhinologists as to the direct cause of the maldevelopment.

Nasal obstruction is the indirect cause of maldevelopment; mouth-breathing, or a constant state of perverted muscular action, is the direct cause. By a comparison of this state of perverted muscular traction with

the normally closed mouth, we see that the shape, size, and form of the arches depend upon "the equilibrium of forces created through the medium of the surrounding tissues." Should the tongue be lost, the arches would collapse inward, or fail in their outward development. In the case of a normal breather, the mouth being closed, the lower lip restrains the protrusion of the upper anterior teeth. The tongue, which lies equally between the upper and lower arches, stimulates the lateral development of the teeth; while the vacuum created between the dorsal surface of the tongue and the roof of the arch contributes to the development of the vault of the mouth in a downward direction. In the mouth-breather, this most delicately balanced arrangement is destroyed, and each phase of this characteristic deformity can be easily attributed to incorrect functioning and placement of the soft parts.

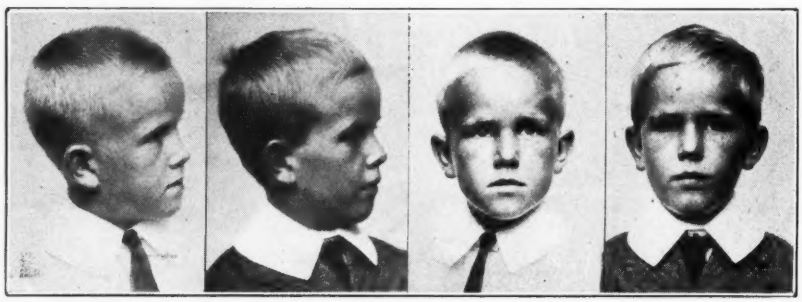


Fig. 12. Fig. 13. Fig. 12. Fig. 13.

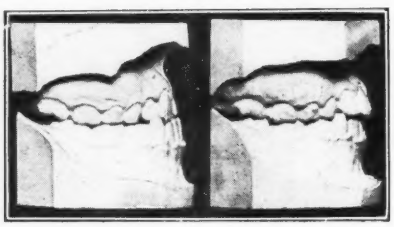
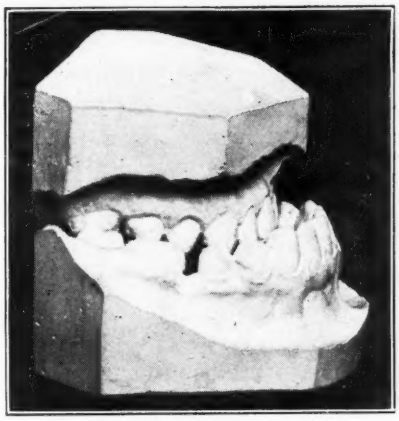


Fig. 14.

Fig. 10 shows a typical deformity indirectly due to nasal obstruction; Fig. 11, the case after orthodontic treatment had restored not only nasal breathing, but the facial lines to their original contour, and the jaws to their normal shape and size. This particular patient, like thousands of others, had been relieved of nasal obstruction, but not of mouth-breathing. A rhinologist had assured her parents that this was merely "habit." The lips were closed at night by means of court plaster, but to no purpose. A child with a narrow, high arch has a correspondingly maldeveloped nasal tract, and usually a deflected septum; but even when the latter is not present there is still insufficient space for breathing the amount of air necessary for the perfect oxidation of the blood. Hence "habit" is not the cause of the continued mouth-breathing after the removal of long-standing adenoids The direct cause is a deficient nasal tract. In such cases the court plaster should be condemned, for its use will produce physical injury.

Hypertrophy of the Faucial Tonsils.

A continued enlargement of the faucial tonsils, which are situated on each side of the base of the tongue, produces in all cases a deformity like that shown in Fig. 12, differing only in degree.



Models to Fig. 15.

Fig. 15.

Fig. 16.

These glands, which are peculiarly susceptible to hypertrophy in children, create a constant desire to thrust the tongue and mandible forward in an effort to relieve a sensation of fullness and tenderness. Should this

practice be continued for even a short period of time during the eruption and interlocking of the six-year molars, the malrelation of the two arches will be firmly established, positively necessitating orthodontic treatment which alone can restore jaw relationship. This condition should be recognized and treated during the active period of growth, for a preventative treatment is more valuable than a curative.

Fig. 12 presents a boy of eight whose tonsils were successfully removed twelve months before. Here we might expect the removal of the cause of malocclusion to effect a cure, but a cure is prevented, not only by the mallocking of one jaw to the other through the medium of incline planes on the cusps of opposite teeth, but also by the tremendous forces of mastication transmitted through these inclines and acting as mechanical stimuli to perverted jaw development. After forty days of treatment, the jaws were shifted to a normal relation. Compare Figs. 12 and 13. There was no pain of soreness during the treatment of this case. Fig. 14 shows the relative position of the arches before and after treatment for malocclusion. From Fig. 15 you can see the value of early treatment. Here maldevelopment progressed from an age between six and nine to eighteen. Had the case of Fig. 12 been allowed to continue until maturity, a condition similar to Fig. 15 would have been the result. Fig. 16, after eighteen months of treatment, is showing improvement. Treatment will continue for at least one year longer.

In concluding my suggestion relative to the etiological phase of malocclusion, I most earnestly advise a closer observation in efforts to discover the indirect and exciting causes of all cases presented for treatment. My observation convinces me that if the remote cause of malocclusion can be discovered and removed, there will be less fruitless treatment.

JUDGMENT IN ORTHODONTICS.

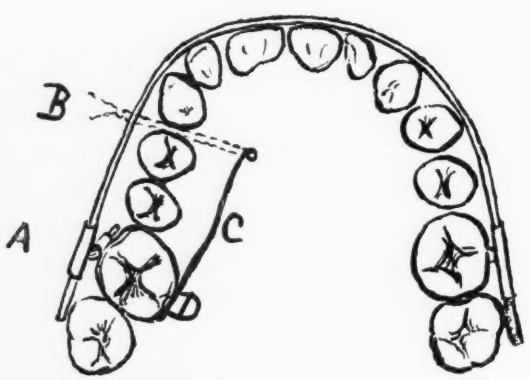
By E. A. Bogue, M.D., D.D.S., New York, N. Y.

AS I understand it, judgment must be based upon a knowledge of facts. We are dealing with living tissue that for some reason has become deflected from its normal position. We have to deal with the forces which contributed to its deflection, if the patient is young enough, we have to deal with the forces which develop the animal, and we ought to know as much as we can of what constitutes normality in order to understand abnormality. I do not think I can do better than to describe a case to show the basis of judgment used in it, thereby exposing my own lack of knowledge, that I may incite my confréres to in turn enlighten me.

A young lady of 17 was brought to me for a consultation, by her uncle, a gynecologist, at the request of an intimate friend, a rhinologist. She had lately been in the hands of a dentist. Although 17 years old, she is but five feet two inches in height and weighs 110½ pounds. She is not a mouth-breather, but has a deflected nasal septum and greatly desires to grow taller. I found that the dentist had, three years ago, extracted the two upper first

bicuspids and a lower central incisor. I found the wisdom teeth appearing through the gums, though not having attained their full growth. I found the two upper molars on the right having lingual occlusion with the lower molars, while those on the left were undecided whether to bite lingually or buccally. The upper central incisors measured 36/100 in width and the principal molars were all small. The loss of the first upper bicuspids had caused a narrowing of the dental arches (this means *narrowing* after having once been wider), and this anatomical condition means also a narrowing of the nasal passages, as the intermaxillary bones are diminished in size. The three lower incisors that are left after the extraction of one, lap each other, while the cuspids, which ought to be upright like pillars of Hercules, incline inward toward the tongue, and in the closure of the mouth and teeth, the upper centrals nearly cover the lower incisors with which they are slightly in contact. The angle of the lower jaw, from the temporo-mandibular articulation to the incisors, is always such, that, as the mouth is opened and closed the incisors describe the arc of a circle and move forward almost as much as they move upward: when, therefore, years shall have passed and the back teeth in this case shall have worn, or broken, or decayed, there will be a greater or less closure of the jaws, and this means that there will be an advance of the lower incisors and of the teeth back of them which will cause a spreading apart of the upper teeth with which they are now in contact, the evil result of wear and tear being greatly intensified by the loss of tooth substance which has already taken place. The orthodontist, who considers nothing but his art and the accurate and normal occlusion of all the teeth, spreads such arches as this, inserts the missing teeth, and thinks he is doing good service. I have done this once, and spread both arches enough to insert the four extracted molars. I did not advise this operation, but consented to it under pressure and accomplished it, but will never do it again. In the present instance the administration of thyroid or pituitary extract was discussed by the three of us—the rhinologist, the gynecologist, and myself, and we agreed that there was such an intimate relation between all the organs involved that where "one member suffers all the others suffer with it". If a little child suffers from its ears, it is more than probable that its nasal passages are defective; if its nose is partially closed, it is almost certain that its teeth are irregular; if the teeth are irregular, mastication will be imperfectly performed and the development of the bones of the jaws and of the face will be deficient. This includes not only all the air spaces and passages in the nose, face and head, but also reaches to the lungs. The lungs, because of an insufficient supply of air, fail to develop as they should and that leaves the chest cavity too small to allow the proper action of the heart, and so the child often remains below the size that he ought to attain, The medical man recommends mountain air, sea bathing, or outdoor life and exercise—all good things—but fails to spread the nasal passages so as to allow the free passages of the needed air. This is done by spreading and articulating the dental arches. Now, the question arises—can it be done in this case, and will the administration of the glandular extracts, Pituitary, Thyroid, and Thymus, be of service in promoting the growth and development of this patient, or must remedial measures be wholly mechanical—the result of outside influences? To determine this question

I had X-rays taken to discover the condition of the epiphyses, for if the epiphyses are complete no further growth need be anticipated, while if they are not complete, we may hope that the administration of the glandular extracts and the institution of the proper exercises of respiration, mastication, and the performance of all the functions of the body might cause a resumption of growth. These X-rays were sent to Boston for the opinion of Dr. George, who has done a great deal of work on this subject for Prof. Rotch. He reports that "epiphyseal growth is practically complete, and (in his opinion) nothing will give any further development of these epiphyses" . . . . . "and in my experience under these conditions stimulating the glands will not produce any development of the bones". These X-rays show the epiphyses of the tibia, both at the ankle and below the knee, and of the femur above the knee and at the neck, and they have united so their growth is probably completed. The epiphyseal lines at the wrist have more than half disappeared and growth here has probably stopped. Exercising the best judgement that we can reach in this case, I have concluded to rapidly



A.—Swivel tube attached to band.
B.—Twisted silk tying wire (*C*) to arch.
C.—Wire of clasp metal No. 20 gauge.
D.—Band with vertical tube to receive the stem of the swivel.

spread the upper molars with a screw so as to reach a proper occlusion with the lower. Any rotation or torsion that may be required for these irregular molars will be attained by putting bands with vertical tubes on the molars requiring torsion, with gold clasp wires standing off lingually from the upper arch of teeth, soldered to these bands. Into these vertical tubes will be placed the shank of a swivel tube, and into the swivel tube a horizontal wire arch carefully bent to the exact size that that arch of teeth ought to be. When this apparatus is cemented to place and properly assembled, the lingual clasp wire having a loop at its end is tied to the labial arch which passes from molar to molar, causing such rotation as may be required. When the molars are made to articulate properly in this case I propose to examine the positions of all the anterior teeth to see if they cannot with propriety be left as they are rather than to subject the patient to the necessity of wearing artificial teeth all her life. It may be possible that knuckling a few proximal cavities in the future will so open the mouth as to reduce or obviate some of the dangers that attend the present close occlusion.

DUPLICATING ORTHODONTIA MODELS.

By J. A. Cameron Hoggan, D.D.S.,
Professor of Orthodontia in the School of Dentistry of the Medical College of Virginia, Richmond.

FLAKE glue (Fig. 1) is prepared in thin chips about 1/32 inch in thickness. It is the glue which is used for duplicating plaster decorations on ceilings and statuary. The ordinary variety of glue is not suitable for this purpose. A tin dish about 8 inches long, 4 inches wide and 3 inches deep (Fig. 2) is the right size to contain two models and sufficient glue. An ordinary double

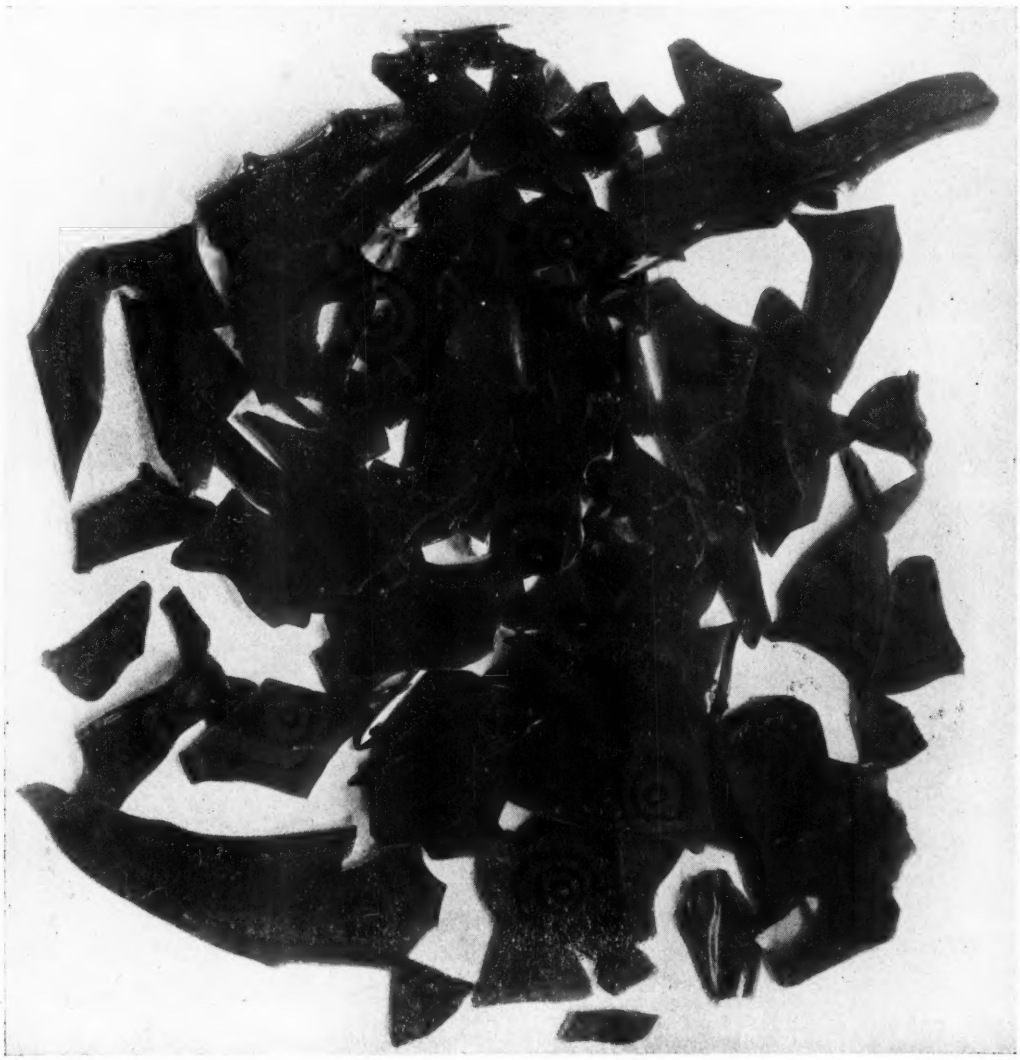


Fig. 1.—Flake glue.

boiler, the inside portion to contain about two quarts, completes the necessary apparatus. The inside portion of double boiler is filled with flake glue, and sufficient cold water is then added to cover. This is allowed to stand

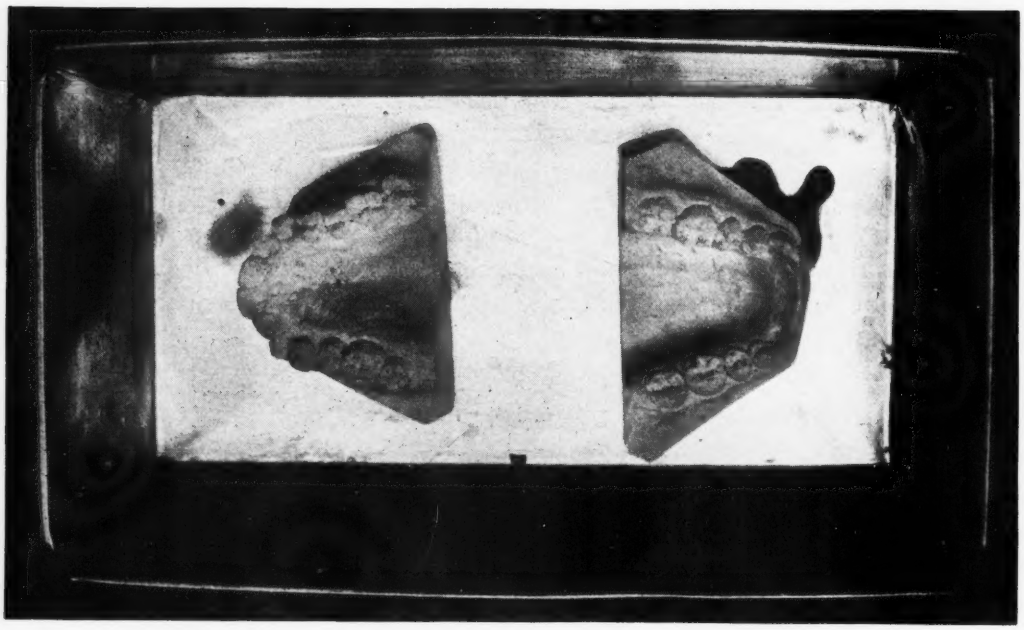
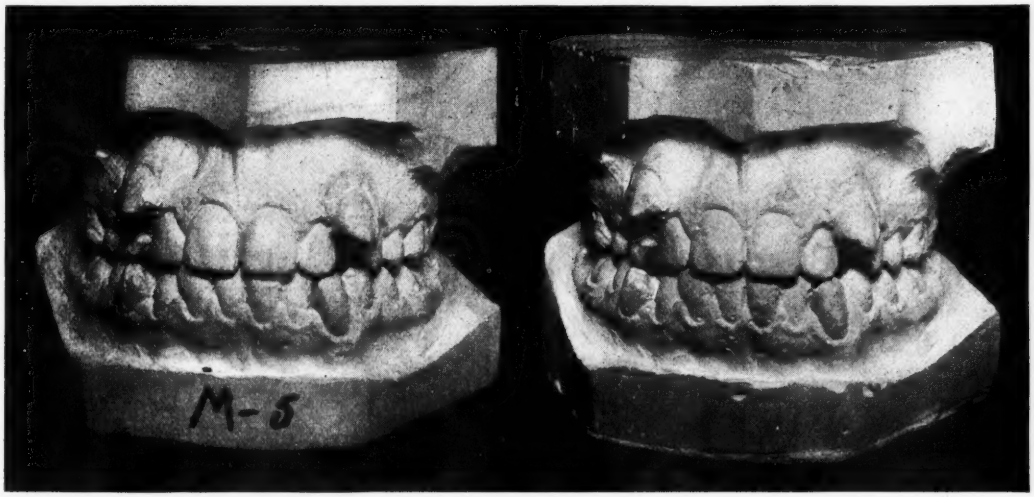


Fig. 2.—Tin dish with models placed in bottom ready to be poured with glue.

Fig. 3.—Glue impression after models have been removed.

until the glue becomes softened, usually about 30 minutes. Half of the water is then removed from the glue. Water is placed in the outer boiler, the two parts of the boiler put together and placed over the flame. It is al-



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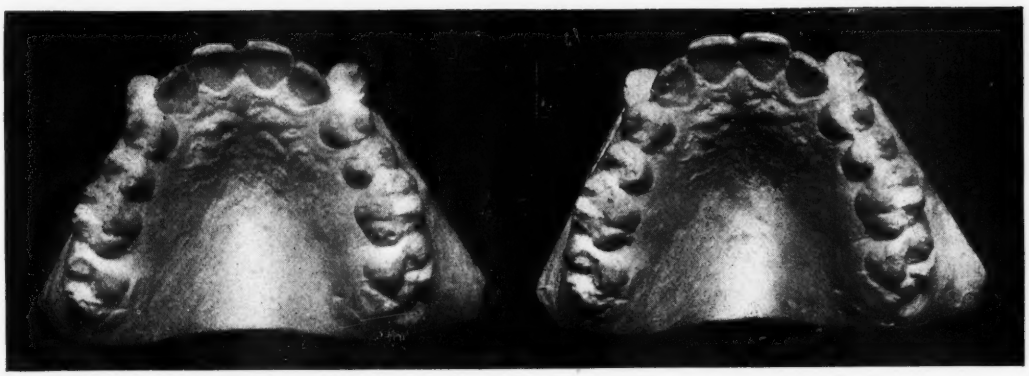

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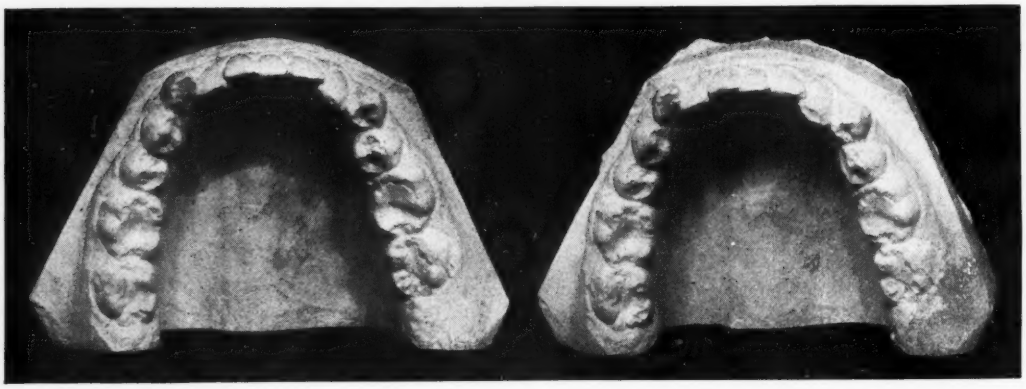
Fig. 4.

lowed to heat until the water in the inside boiler rises to the top of the glue. The double boiler is then removed from the flame and the whole mass is allowed to stand until liquid, after which the inside boiler is lifted out of the

hot water in the lower portion, and the glue allowed to stand until a scum begins to form on the surface, when it is ready to pour.

The models to be duplicated are first thinly coated with vaseline and placed in a tin dish with teeth presenting upwards (Fig. 2) and the glue poured over them. The secret of the success of this process is to make the mass of glue liquid at the lowest possible temperature, then to pour it over the models at the moment in which it is still liquid, but beyond which it would congeal. If models have a tendency to rise in liquid glue, they may



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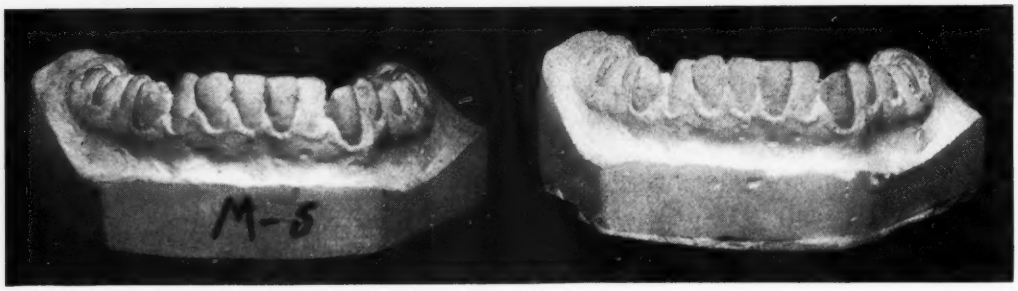

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Fig. 4.

be cemented to the bottom of the pan with a little sticky wax. This is allowed to stand in a cool place for at least 12 hours, after which congealed glue is removed from the pan and the models are carefully lifted out by springing the glue aside. The glue impression is now ready to pour (Fig. 3) with Plaster of Paris. These models may be removed from the impression in 10 minutes but are set aside for an hour to allow the surface of the model to set, it being softer than ordinary models for the depth of $\frac{1}{4}$ inch. Fig. 4 shows models removed from the glue impression. Model is then retouched, and if desired several sets can be reproduced from the same glue impression.

DENTAL RÖNTGEN REPORTS.

By E. H. Skinner, M. D.
Professor of Radiology at the Kansas City Dental College, and the Dewey School of Orthodontia.

THESE case histories are presented with the object of showing how the Röntgenogram can be employed in dealing with obscure cases. While some of these cases are not directly concerned with malocclusion of the teeth, all of them present conditions which may be found sometimes in patients who may come under the observation of an orthodontist. I am aware that the orthodontist generally receives his patients from the general practitioner, but some of them may present some of the conditions described. The first case I present is one of special interest to the orthodontist because of the many complications it presented.

Case No. 4866.—Mrs. S. Age 32. Referred by Dr. Purcell. At age of six she received a blow upon the chin and suffered considerable pain and gradually acquired a "closed bite." When seen she could not separate the front teeth more than one-half inch. The occlusion was good. The Röntgen examination (Figs. 1, 2 and 3), showed the condyle on left side of irregular contour and it seems to be squared and the glenoid cavity conforms to this condyle, in that it seems to be a box or squared socket into which the squared condyle fits very neatly. This appears to be the cause of the limitation of motion. Upon viewing the oblique exposure of the injured side (Fig. 3) one notices the unusual development of the coracoid process, together with an encysted, unerupted third molar.

Dr. J. B. Murphy of Chicago performed his operation of athroplasty in this case with flattering results.

Case No. 5158.—Mrs. P. Referred by Dr. R. L. Christy. This case was referred for a Röntgen film to determine whether the tooth, marked by an arrow (Fig. 4), had sufficient anchorage to maintain a bridge abutment. The resulting film (Fig. 4) shows that this tooth is a deciduous tooth without sufficient anchorage for a bridge. In orthodontics, a great many deciduous teeth are retained too long, and their condition can best be determined by the Röntgenogram.

Case No. 6349.—Dr. O. Age 32. Referred by Drs. W. S. Sutton and Milae. This case was first referred for a Röntgen examination of the spine several months ago to determine if possible a cause for a persistent lumbago. No bony changes in the spine indicative of arthritis present although an anomalous sixth lumbar vertebra was discovered which could hardly have had much to do with the case.

In a search for a source of the infectious origin of the lumbar myositis (lumbago), the patient remembered that a molar tooth had been pulled many years ago and that part of one root was never found. The accompanying Röntgen film (Fig. 5) shows this root surrounded by an area of necrotic bone, wedged between the second molar and the bicuspid tooth. The second and third molars have shifted forward so that the crown of the second molar and the bicuspids are approximated.

Fig. 1.—Postero-anterior view of skull showing the normal right condyle capped by the circular outlines of a normal glenoid fossa. The left side shows an obliteration of the glenoid outlines.

Fig. 2.—Lateral Rontgenogram of same case as Fig. 1. Note the squared shadow of the condyle with the shifting downward and backward of the glenoid fossa.

Fig. 3.—Lateral oblique Rontgenogram of same case as Figs. 1 and 2. Note the dark indefinite shadow of the condyle. The coracoid process shows unusual growth in size and length. It extends far above the zygoma. An unerupted encysted molar is seen in the vertical ramus of the jaw.

Case No. 5826.—Mrs. W. Age 40. Presented pyorrhea alveolaris of quite general involvement. The first lateral had been crowned but the tooth was constantly lame and seemed loose. Röntgen film (Fig. 6) shows an unerupted lateral impinging upon the root of this tooth and the apex of the crowned tooth appears to be resorbed considerably. There is little if any healthy anchorage for the crowned lateral. It has been found by many investigators that an impacted tooth will often cause the absorption of the root of the approximating tooth. Canines have been known to absorb lateral and central roots.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

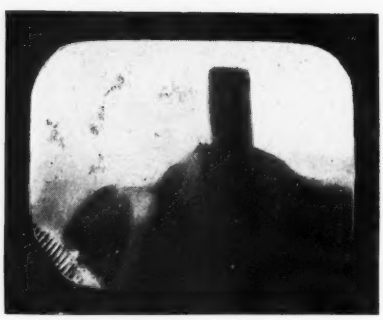


Fig. 8.

Case No. 6339.—Mrs. A. Referred by Dr. R. M. Seibel. This case was first referred for Röntgen negatives of an injured knee by Dr. R. W. Holbrook. These revealed a hypertrophic arthritis of both knees with exostoses about the head of the tibias, the patellas and lower end of femurs

quite typical of late changes in an infectious arthritis. In searching for the source of the infection the case was referred for this negative (Fig. 7) of a lame lateral incisor, which shows a distinct abscess at its root. It appears that a bit of root filling is in the abscess cavity.

Case No. 6087.—Mr. K. Age 42. Referred by Dr. E. J. Craig. This case presented a minute sinus at the side of the lateral incisor of the lower jaw. We were surprised to find a large unerupted and encysted tooth in the central part of the anterior portion of the lower jaw (Fig. 8.) This was removed under gas and oxygen anæsthesia by Dr. Craig and the case cleared up nicely.

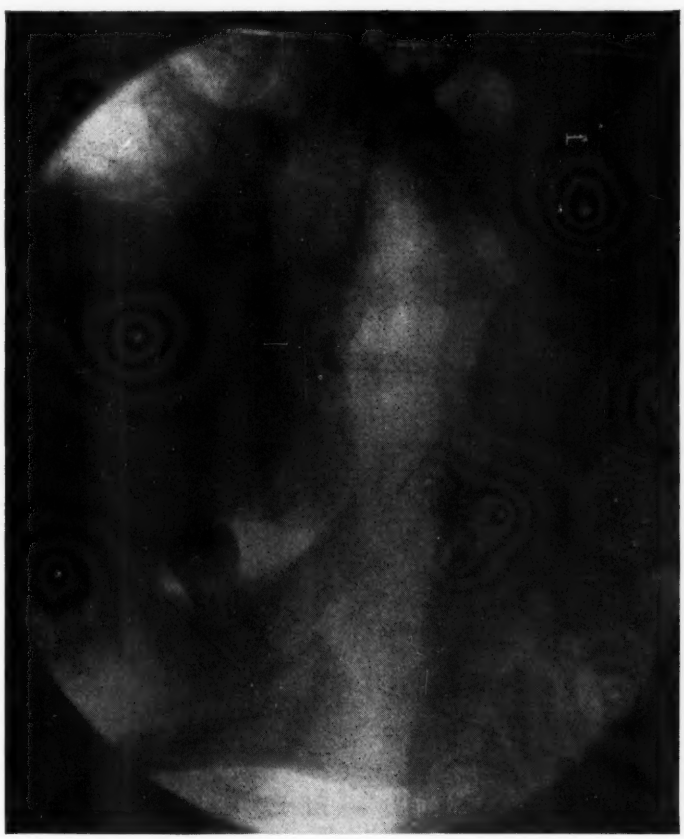


Fig. 9.

Case No. 4037.—Mr. P. Referred by Dr. H. P. Kuhn. Clinically this case has shown a progressive enlargement of the alveolar margin of the superior maxillary upon the left side, which was beginning to interfere with the complete closure of the lower jaw. The three molar teeth seemed normal. The question was asked of the Röntgenologist as to whether this was a cyst or tumor or unerupted tooth.

The accompanying reproduction of the Röntgen plate (Fig. 9) shows a simple hypertrophy of the alveolar border of the superior maxillæ which is seen to come in close contact with the ascending ramus of the lower jaw when the bite is closed. There is no unerupted tooth present, no cyst and no abnormal densities indicative of malignant growth. The bone texture is normal. Therefore, the Röntgen diagnosis is simple hypertrophy of the bone.

Case No. 3048.—Mr. K. Age 22. Referred by Dr. J. G. Sheldon. Clinically, this young man had noticed the gradual development of a malocclusion with the lower jaw dislocated toward the right. Röntgen negatives were made of both the right and left condylar areas. The right side (Fig. 10) shows the normal condyle and glenoid cavity directly in line with the shadows of the zygoma. The left side (Fig. 11) shows an abnormally

Fig. 10.

long condyle which is better portrayed in Fig. 12. Dr. J. G. Sheldon concluded that this was a congenital overgrowth of the condyle upon the left side and did a resection, thereby restoring normal occlusion. Such conditions as this may often be the cause of over-development of the mandible on one or both sides.

Case No. 6203.—Mr. T. Age 30. Referred by Dr. Wm. J. Brady. The patient was kicked on the chin by a mule when twelve years of age. The jaw was thought to be fractured and was so treated. The deformity became more apparent with increasing years. Inspection at this time, (March, 1915), shows chin dislocated to right side; teeth all well formed,

Fig. 11.

regular, and no deformity of superior maxillary; no ridging of inferior maxillary or any irregularity indicating fracture of the horizontal ramus.

Röntgen examination: Figs. 13 and 14. Dislocation of condyle downward and outward upon the left side and upward and inward upon the right

side. Both condyles appear normal in contour with no growth malformation. Dental canals regular and normal. Unerupted third molar upon left side.

Conclusions: Bilateral dislocation of inferior maxillary with no fracture of ramus or condylar portions.

Fig. 12.

In the interpretation of Röntgen negatives of the condyle and glenoid fossa it is well to remember that normally the shadow of the condyle is covered by the shadow of the posterior portion of the zygoma as in Fig. 10.

American Society of Orthodontists Meeting.—There will be a meeting of the American Society of Orthodontists, held Monday, August 30, 1915, at 9:30 A. M., at San Francisco, in the room assigned to the Orthodontic Section of the Panama-Pacific Dental Congress. It is respectfully requested that as many members of the American Society of Orthodontists, as possible be present. F. C. KEMPLE, Pres.; F. M. CASTO, Sec'y-Treas.

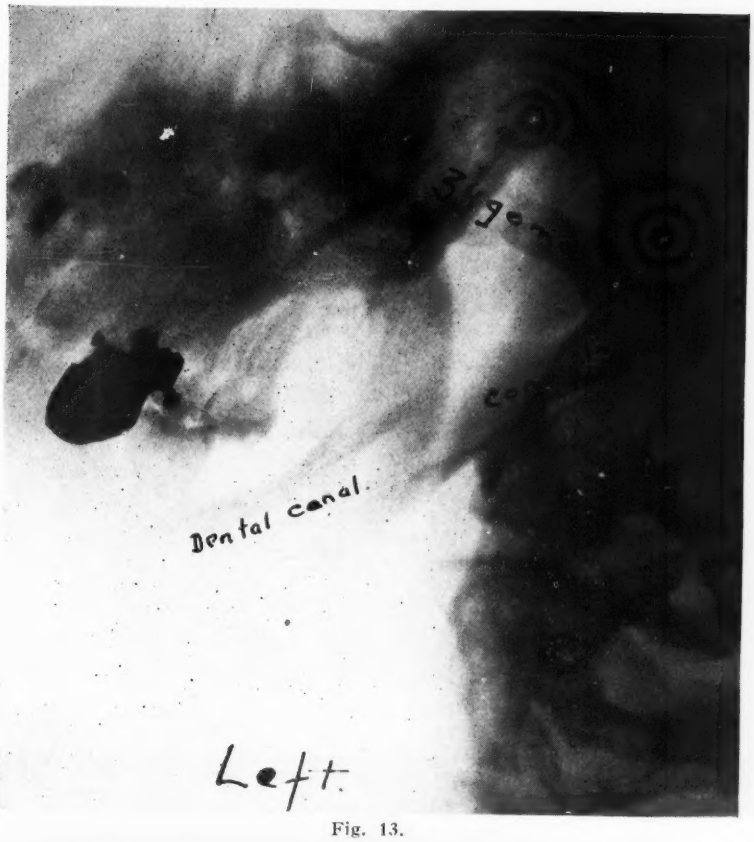


Fig. 13.

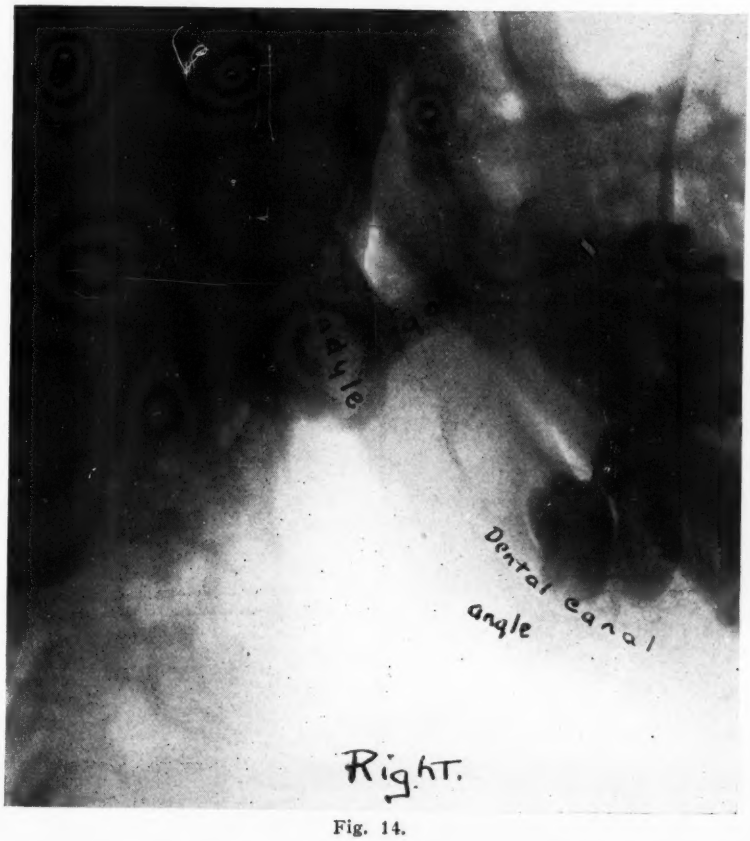


Fig. 14.

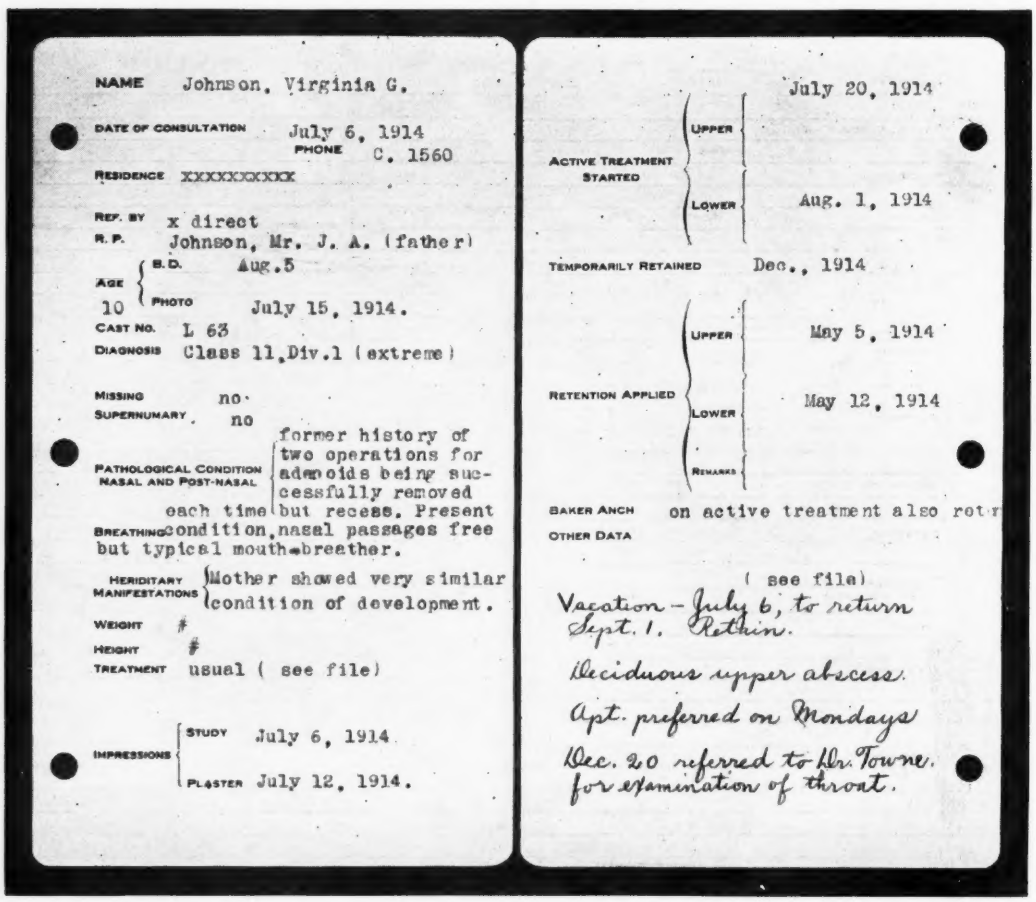
CASE HISTORY.

By H. C. Pollock, D.D.S., St. Louis, Mo.

As a case history this one is quite typical of that great class of cases included in Class I, Division 1 (Angle classification), both as to etiology and type of development.

The previous history indicated the patient had been operated for adenoids three years previous, being followed by a recurrence, at which time another operation was performed. Upon presentation for orthodontic treatment the nasal passages were declared clear, which demonstrated that normal respiration was not being interfered with as a result of any lymphoid tissue. It is also of interest to note that in childhood the mother had developed the same type of malocclusion.

Mouth-breathing, as a result of adenoids being present in the nasopharynx from a very early age, no doubt, it would be agreed, is directly responsible for this condition, and by referring to Fig. 1 it will be noted that nasal breathing with the teeth in their original position would be a physical impossibility. The chief characteristics of this case were a typical narrow arch, anterior teeth protruding in advance of the lower lip, the permanent first molars and the remaining deciduous teeth in distal occlusion.



NAME Johnson, Virginia G.

DATE OF CONSULTATION July 6, 1914 PHONE C. 1560

RESIDENCE XXXXXXXXXX

REF. BY x direct

R. P. Johnson, Mr. J. A. (father)

AGE 10 B.D. Aug.5 PHOTO July 15, 1914.

CAST NO. L 63

DIAGNOSIS Class 11,Div.1 (extreme)

MISSING no.

SUPERNUMARY no

PATHOLOGICAL CONDITION NASAL AND POST-NASAL former history of two operations for adenoids being successfully removed each time but recess. Present BREATHING condition, nasal passages free but typical mouth-breather.

HEREDITARY MANIFESTATIONS Mother showed very similar condition of development.

WEIGHT #

HEIGHT #

TREATMENT usual (see file)

IMPRESSIONS STUDY July 6, 1914

PLASTER July 12, 1914.

July 20, 1914

ACTIVE TREATMENT STARTED UPPER

LOWER Aug. 1, 1914

TEMPORARILY RETAINED Dec., 1914

RETENTION APPLIED UPPER May 5, 1914

LOWER May 12, 1914

REMARKS

BAKER ANCH on active treatment also ret

OTHER DATA

(see file)

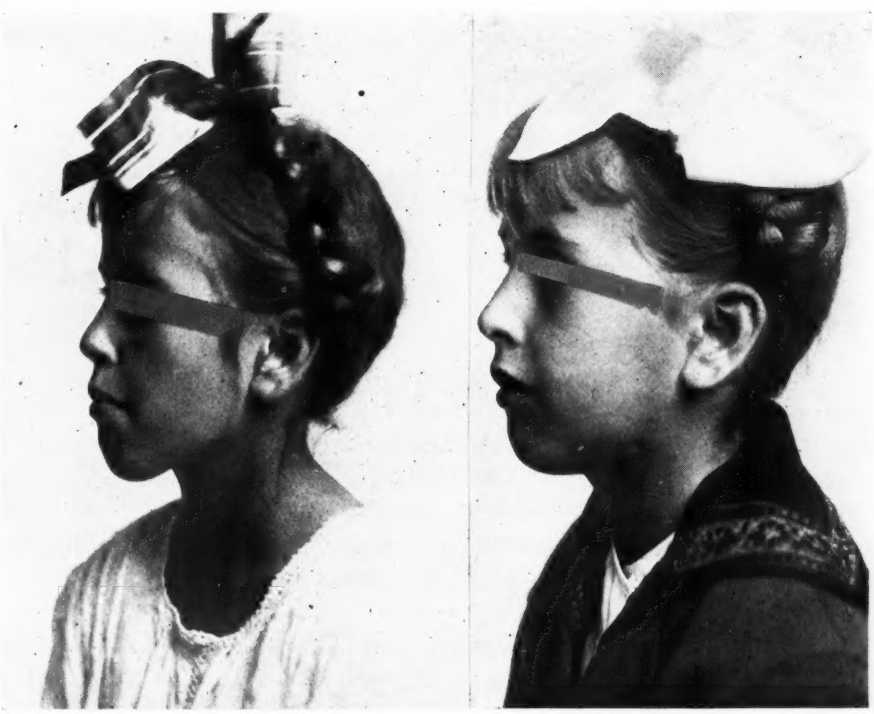
Vacation - July 6, to return Sept. 1. Rethin.

Deciduous upper abscess.

Apt. preferred on Mondays

Dec. 20 referred to Dr. Towne. for examination of throat.

Loose leaf case record.



July 15, 1914. April 10, 1915.

Treatment.—Impressions were taken in plaster and at periodical visits of a few days' interval, clamp bands were adjusted upon the upper first molars, a 17-gauge gold platinum arch fitted and the buccal tubes on the molar bands adjusted accordingly. The appliances were allowed to be worn

a few days and then cemented firmly to place. Upon the first deciduous molar was then adjusted .030 band spurs, being attached to the lingual side of same in order to control the buccal movement of the deciduous teeth. The upper arch was then slightly expanded and a similar appliance was adjusted to the lower teeth, after which a Baker anchorage was attached between the two arches. This equipment by periodical adjustment remained effective for about five and one-half months. After this the case was allowed to rest for two months with little or no movement of the teeth, the appliance resting upon the teeth in a passive state, no energy being exerted except that of the Baker anchorage. This allows the teeth to assume better occlusion and relative position on account of the flexibility of the appliance before the teeth are permanently and more or less rigidly retained. The case was then retained by means of an upper lingual wire being fixed at either end to the first molars, which in turn was engaged lingual to the upper central incisors by an inclined bite plane as described by Rogers.

The lower arch was equipped with a lingual retaining wire which engaged the intermaxillary anchorage. The wire was then adjusted each night during the sleeping hours, this being sufficient to retain the case until the occlusion of the first molars is well fixed in position.

Tumors of the Jaws.—By *Charles Locke Scudder, M.D.*, Surgeon to the Massachusetts General Hospital. Octavo of 391 pages, with 353 illustrations. 6 colored plates. W. B. Saunders Company, Philadelphia. Price, net, $6,00; half morocco, $7.50.

Dr. Scudder's "Tumors of the Jaws" is by far the best monograph that has ever appeared upon this subject. He takes up the various growths which may be found in the oral cavity, beginning with the Epulis, which is described as to its location and appearance and deals very thoroughly with this condition, including the prognosis, diagnosis and treatment.

Chapter II deals with sarcoma of the jaws in the same manner and shows a large number of cuts which will be of very great assistance in the diagnosis of such conditions. Almost every type of tumor is taken up, including the Odontomata and Carcinoma of the Jaws. A chapter on the Diagnosis and Operative Treatment of Malignant Diseases of the Upper and Lower Jaws is appended.

Chapter IX is devoted to prosthesis and the construction of such devices as may be worn after operative treatment. Only a few of the methods are shown which can be used to benefit patients who have been so unfortunate as to suffer from the removal of a large portion of the maxillæ or mandible.

This book is a very useful addition to the library of anyone interested in pathology, but it deals only with tumors of the jaws, and necessarily must be supplemented by a general work on pathology. In fact, it was not the intention of the author to cover anything except the special subject of tumors of the jaws, which he has handled in a very commendable manner.

THE IMPORTANCE OF RICKETS TO THE ORTHODONTIST.*

By F. Hecker, B.S., D.D.S., A.M., M.D., Kansas City, Mo.

THE orthodontist, many times in the pursuit of his practice, is confronted by children that are very poorly nourished and have a malocclusion that is variable in degree. The close observer of patients at once asks himself the question: What is the most likely etiological factor capable of bringing about the changes of the bony skeleton, the musculature, and the deformity of the arrangement of the teeth in the maxillæ and the mandible of this type of patients?

Nature plays many queer and unexplainable pranks in the processes of the early development of man's body. To some she is very kind, to others she is cruel. One has but to note the various members of a family to see this fact excellently demonstrated. One member of the family goes through life without any serious illness while another member of the same family, apparently as healthy, is at all times fighting illness during his life. Just so it is when one considers the etiology of malocclusions.

Etiologically, one cannot avoid considering the predisposing and the exciting causes. Under the head of the predisposing causes one must name such diseases as are contracted in infancy and childhood, which are capable of producing nutritional development changes of the osseous parts of the body. The first disease, in order of importance, which materially affects the human body, is rickets. Therefore let us consider this disease not merely as a layman, but let us enter into the disease as a professional man, interested in the welfare of his patients.

Many indeed are the cases of rickets which are overlooked by members of both the medical and dental professions and it is for this reason that the writer has entered into the subject from the viewpoint of the medical man.

One learns on reading of this disease, that there is no time between six months and thirty-five years of live that this disease cannot make itself manifest. The most common ages, however, at which the disease makes its appearance is between the ages of six months and two years.

Etiology.—Previous diseases are important factors, etiologically, in the production of rickets. Those most commonly considered responsible are: Pneumonia, dysentery, bronchitis, typhoid fever, syphilis and tuberculosis. Borginsky in reporting 71 cases examined and studied states that in 27 of this number not only was the disease present in the child but that the mothers were affected as well. In all likelihood the findings of Kossowitz and Schwartz were the same as noted by Borginsky and it is because of these findings that these two gentlemen offered the theory of congenital rickets. Chossat in his experiments learned that if lime is deducted from the food of small animals the bones of the animals thus treated became soft, and that if a diet free from lime was continued the animals died.

Hetizeman contends that if lactic acid is introduced with the food given to small animals rickets will result, and that at a later period osteomalacia

*Read before the Alumni Society of the Dewey School of Orthodontia, Kansas City, Mo., February, 1915.

develops. Forcheimer in his "Prophylaxis and Treatment of Internal Diseases" states that in some instances women believed that pregnancy could be prevented as long as they were suckled, and that after the child had been weaned puppies were used to suckle the woman. It was noted when this was done that the puppies developed rickets. The probable reason the puppies developed rickets is that they did not receive, in the milk of the woman which suckled them, the proper nourishment needed for the development of bone.

In the human being one of the most important factors responsible for the presence of the disease is the absence of mother's milk. Hence, when babies and young children which are being fed bottle milk develop rickets, it is evident they are not receiving the proper nutritive substances demanded for their osseous development. Surroundings, likewise, are of great importance. Lack of sunshine, the over-crowding of families in small quarters, improper ventilation, malaria, chronic coughs, or any organic lesion, are factors which greatly lessen the body strength of the mother, and by so doing have a marked physiological action on the mammary glands and the milk. Milk produced in the presence of any disease which affects lactation, is of poor quality. If this fact is not learned at an early date either by the doctor or the mother of the child, the child is almost certain to develop rickets.

Pathology.—Pathologically, this disease is confined to the development of the bones. In addition to this process there is also present an anemia of the tissues. The primary lesion of this disease is characterized by a hyperemia of the periosteum, the bone marrow and the cartilage of the bone. The spleen and the liver are enlarged, and there is frequently an enlargement of the lymph nodes. The kidneys on examination do not present any pathological change.

Microscopically, the epiphyses of the bones show a marked increase of the cartilage cells. Mathematically, the increase of the cartilage cells is from 4 to 10 times the quantity noted in normal developing bone. The marked increase of the cartilage cells causes the bone to be very soft when it is compared to the density of normal developing bone.

The increase of the excessive amount of cartilage cells at the epiphysis produces a very perceptible enlargement of the epiphysis when compared to the epiphysis of normal developing bone. In some instances this process is so pronounced that the epiphysis has a swollen appearance, and is very irregular in outline when compared to the normal size and outline of young developing bone. The consistency of rickety bone is so soft that one can indent it easily with the finger nail.

The developing bone from a normal child of the same age cannot be readily indented with the finger nail. It has been shown experimentally that the hyperemia of rickety bone produces a decomposition of the lime salts which are being deposited; and it is because of this deficiency of the lime salts contained in the developing bone which causes it to become soft and flexible. In normal bone a quantitative examination has shown that it is composed of 2/3 of mineral matter, while rachitic bone contains 1/3 of mineral matter. From the foregoing, one can readily explain the defor-

mities noted in the long bones, and reasoning from analogy, one can explain to a good measure the probable cause of many of the malocclusions observed. The mandible and maxillæ like the long bones are affected in their development; and in the process of their laying down, a poor foundation has been laid for the future development of these bones.

In the paroccipital region, the plate of bone of the skull of the rachitic child is frequently so very thin that it yields readily to pressure.

The fontanels do not close at the time they should, and many times it is at a late date that the closure is completed. The reason for their failure to close is due to the lack of ossification. The frontal and the parietal protuberances are greatly enlarged, when compared to the normal size of them. This prominence is in all likelihood due to the marked excessive proliferation of the periosteum. Consequently, one notes a child with a very broad forehead, with markedly increased frontal prominence. The head instead of developing ovally commences to take on the square box-shape which is so very characteristic of rickets.

A cut section through the epiphyses of the rachitic bone shows it to be highly vascular, having a bluish color, and is very much softer than normal bone. The shaft of the bone, next to the periosteum, is soft and thickened. A section through the flat bones shows a spongy vascular substance which is easily indented.

Microscopically, the rickety bone presents a greatly increased number of cartilage cells when compared to the number of these cells observed in the normal bone. Also an increase of the vascularity of the proliferating zone. The areas of the bone which should be calficied show large quantities of cartilage tissue. The under layer of the periosteum is also very vascular and shows a great excess of uncalcified cartilage. In the flat bones, the bony trabeculæ are eroded, and in the eroded areas are observed minute newly-formed blood vessels.

As soon as the rachitic process ceases and a restoration to the normal development of the bone begins, the excessive proliferation of the cartilage cells ceases, and calcification of the bone takes place. The excessive enlargement of the bone due to the hyperplasia is absorbed and the bone rapidly returns to a normal state, save for such deformities as result from the active processes of the disease. Ossification continues with the osseous development of the child.

Symptomatology.—One of the earliest symptoms of rickets is constipation. The next in order are head sweating, while the child is nursing; the rolling of the head on the pillow at night; pallor of the skin, profound anemia, rachitic changes affect the frontal sutures. The frontal and the lamboidal sutures are distinctly distended. All of the bones of the cranium are markedly affected by the rachitic changes which are going on.

The frontal suture remains open for a much longer time than it does when a normal development of the bones is going on. The head is square in shape and many times is asymmetrical because of the faulty closure of the fontanels and the impaired development of the bones.

The first writer to describe the softening of the bones of the head and the condition thus observed, gave the disease the name of craniotabes.

By this statement the reader must not infer that the casing of the brain, which, under normal conditions is hard, is a soft, jelly-like mass, but that they give readily under pressure.

Another very early symptom of rickets is the tetanic seizures, muscular spasms, and the laryngeal spasms.

Delayed dentition is another symptom of the disease and when the teeth are erupted they are very poorly formed and are irregular in their relations to each other. The occlusion is not correct. As the child erupts its permanent teeth, they are markedly irregular and the deformity is greatly increased. Not infrequently one will observe in the rachitic child that deciduous teeth do not erupt until the sixteenth to twentieth month.

The veins of the scalp of the rachitic child are as a rule greatly enlarged and they are also very prominent.

On examination, one notes that the long bones are greatly thickened and enlarged. The thickening of the long bones can be easily made out by outlining the same by pressure. Many times the enlargement is so pronounced that it can be easily seen with the eye. Sometimes the long bones on their extensor surfaces are convex in shape. A very common accident occurring to rachitic children is the green-tree fracture resulting from a slight fall. In some cases it have been observed that the phalanges are affected by being greatly enlarged.

The bones of the lower extremities are often markedly affected by rickets. Not only are they affected but the musculature is affected as well, and because of this complication marked weakness of the bones and flabbiness of the muscles are observed; the strength of the leg is materially affected and the child is very slow in learning to walk.

An enlarged abdomen is usually present and on percussion it is found to be tympanitic. The loss of the muscle tone, so common in rachitic children, is in all likelihood noted in the intestinal wall as well, and it is perhaps safe to assume that when the loss of the tone of the musculature of the intestine occurs, constipation results. Occasionally there is present a diarrhea, and frequently a marked dilation of the colon, accompanied by stool which is very hard. When this condition exists it is very apt to cause chronic catarrh of the colon. And if this condition develops, one frequently finds that at the end of the passage of the stool a variable amount of glistening mucous is present.

Morse, after a study of the blood of children affected by rickets, concludes that an anemia is present in most of them. The intensity of the anemia, he states, is dependent on the intensity of the rachitic process. There may or may not be a leukocytosis present. In cases in which there is an anemia and a leukocytosis there is also present an enlarged spleen.

There is a marked tendency to irritation of the nerve centers in rickets, and also a general bodily weakness which is very apparent when the child is given a task requiring strength of the musculature of the body. When a rachitic child develops a disease it is usually ushered in with convulsions. This fact is of a great deal of importance, for it shows the extreme sensitiveness of the nervous apparatus and the susceptibility of the nerve centers.

Diagnosis.—The principal symptoms to be remembered to make a diagnosis of this disease are: Head sweating while nursing; constipation; rest-

less rolling of the head on the pillow at night; delayed dentition; irregular position of the erupted teeth and poor quality of the teeth; enlarged epiphyses of the long bones at the elbows, knees and ankles; beaded appearance of the ribs; kyphosis; and bowlegs.

Differential Diagnosis.—Sometimes the very large head of a rachitic child is mistaken for hydrocephalus. The child, when bedfast presents some of the symptoms of poliomyelitis or pseudoparalysis, but an electrical reaction will quickly differentiate these diseases from rickets. The bony enlargements can be differentiated from those resulting from syphilis by the X-ray. In syphilis the shaft of the bone is affected while in rickets the epiphysis of the bone is affected. In syphilis, there may be a necrosis of the bone which is swollen, while in rickets there is no necrosis. A further step is still at hand for the differentiation of the one disease from the other, and that is the Wassermann reaction. Scurvy in infants is very easy to differentiate from rickets, for in this disease the gums are swollen and very spongy and on slightest pressure there is a tendency to hemorrhage. There are also ecchymotic spots on the gums in scurvy.

Prognosis.—The prognosis as to the life of a child affected by rickets is good. As a rule, the active symptoms of the disease exists for about two years. However, one should not take this statement to mean that there are no exceptions to this rule, for in any disease one cannot state a definite length of time of its existence. In rare cases recorded, the disease has existed for many years after its first appearance. The damage sometimes done by the disease may exist during the lifetime of the person affected. Children that have been rachitic when attacked by an infectious disease suffer more than children that have not had rickets, and the prognosis for the rachitic child is not good.

Treatment.—The first step after a diagnosis of rickets has been made is to remove the child to healthy surroundings. Thus, for example, it is useless for one to commence the treatment of this disease if the child is housed in a poorly ventilated and lighted room in which several other children are housed at the same time. The child should have daily tub baths, and after the bath it should be vigorously rubbed with a rough towel. A handful of sea salt should be placed in a tub of water. A change of air from the city to the country is also excellent in many cases.

If the child is over three years of age at the time the disease develops, the nose and throat should be thoroughly examined, and if the tonsils are enlarged, they should be removed. If there is any pain in the nose it should be repaired. No doubt correct breathing has much to do with this disease and the author believes that one of the important factors capable of causing the disease is carbon-dioxide poisoning. One should therefore make the exchange of the gases of the lungs as free as possible, and thus eliminate as much as possible this likelihood of carbon-dioxide poisoning. The intake of air is far more readily performed than is its expulsion. It is therefore imperative that the nose and throat should be cleared of all obstructions. This is especially the case of the nose, for it is so anatomically built that it warms and filters the air before it reaches the trachea, bronchi and lungs.

Dietetic Treatment.—If a breast-fed child presents any of the symptoms of rickets, the milk of the mother should at once be sent to a laboratory of clinical pathology and be examined for its quantitative and qualitative properties and if it is found to be deficient in any one of the normal properties which mother's milk contains, the breast milk should be withdrawn and so modified that the deficiency is added; or, if possible, a wet nurse should be employed. If on the other hand, it is found that the conditions are such that one cannot correct the error in the milk and a wet nurse is not to be had, the next step is to employ modified cow's milk. In addition to the cow's milk, the child should receive barley water, oatmeal water, and later a small amount of fruit juices. If the child is not suckling, it should be given rice, cream of wheat, farina and fresh vegetables which are thoroughly cooked. Vegetables not to be given are cabbage and turnips, for these two vegetables are very hard to digest as they are rich in sulphides. The juices of fresh fruits are also very good, as is also good cream and butter. If the child is old enough to digest the proteids, it should be given good fresh country eggs, fish, chicken and small amounts of rare beef.

Medicinal Treatment.—The medicinal treatment of this disease is secondary to the diet and hygiene; for the only drugs employed which have a direct influence are those which contain such substances as are necessary to the development of bone and the upbuilding of the strength of the affected child. Fowler's syrup of hypophosphites is one of the standard drugs given in this malady. In addition to this, one must see to it that the bowels move regularly and further that the function of the kidneys is normal.

From the foregoing one learns that rickets is a disease which primarily involves the osseous parts of the human body and it is for this reason that the orthodontist should be familiar with the disease.

CURRENT ORTHODONTIC LITERATURE

EDITED BY H. C. POLLOCK, D.D.S.

The Teeth of Primitive Man.

At a symposium on primitive man, T. Wingate Todd, F.R.C.S., of the Department of Anatomy of Western Reserve University, Cleveland, Ohio, in the third paper (*Cleveland Medical Journal*, April, 1915), takes up the teeth of primitive man and points out many facts of interest. In order to contrast the characteristics of modern human teeth with those of the anthropoid apes, Mr. Todd first points out in detail the various anatomical characteristics of the human teeth.

The third molar or wisdom tooth in the European is always smaller than the others, presents very great variety in size, form and date of appearance, and may be very rudimentary or even absent. Hence it has been said to show evidence of modification in the direction of disappearance. But, Mr. Todd observes, this must not be insisted upon, for the Eskimo frequently has his third molars small or crowded out, in spite of the primitive character of the rest of his teeth, and among the negro races, while in some cases the third molar may be small, in other instances not only is it large but there may even be a fourth molar present. All the molars in Homo show a tendency to lose the square outlines of their crowns and become rounded.

The article continues:

"If one turn now to the teeth of the anthropoid apes, one observes first that the canines are veritable tusks, especially in the males. Indeed, all the teeth are large, and there is no tendency toward crowding, with the result that the dental arcades are longer than in man. In consequence of the large size of the canines, the jaws are squarish, the incisors lie in a straight line between the canines, and there is a distinct diastema or space between the maxillary lateral incisor and canine for the accommodation of the lower canine. The palate is much larger and longer than in man. Other differences from the modern human are the following: The premolars and molars lie in a straight line, those of the two sides converging somewhat as they pass backward. The premolars present the same number of roots as do the molars, namely, three in the upper jaw and two in the lower. They have crowns more pointed than is the case in man. In the gorilla the mandibular first premolar is larger than the second. The molar teeth in the anthropoids are squarer than in man, and their antero-posterior (mesio-distal) length is greater than the side to side (labio-lingual) diameter. Their cusps are sharper and longer. In the orang and gorilla the third molar is larger than the other two, and indeed in 60 per cent of orangs a fourth molar is present. In the chimpanzee the third molar as in man, is smaller than the others. When one compares the roots of the molars of the anthropoid with those of Homo, one sees that they are divergent instead of being parallel. In the orang the roots of all teeth are of enormous length.

"Now, consider for a moment the masticatory movements in the anthropoid and in modern European man. In the former, the canines, apart from their offensive and defensive functions, act as dental guides, locking the jaws when the teeth are occluded and prohibiting side-to-side movement. In modern man a somewhat similar result is obtained by different means. Owing to the enharmotic closure of the jaws, that is to say, the overlapping of the maxillary on the mandibular incisors, these teeth act as dental guides in place of the canines, which in their reduced condition are unable to ac-

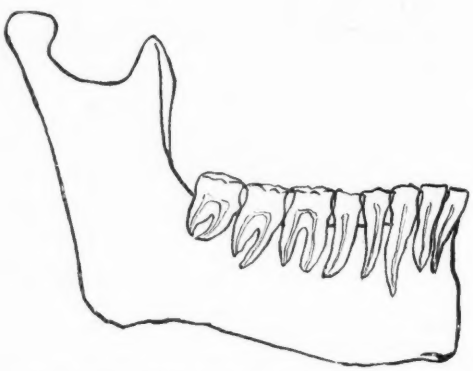


Fig. 1.—Tracing of radiogram of right half of modern human mandible (male, adult, after Symington), one-half natural size. Note the parallel nature of the roots of the molars, the reduction of the canine, the greater size of the second premolar over the first, and the small size of the pulp chamber.

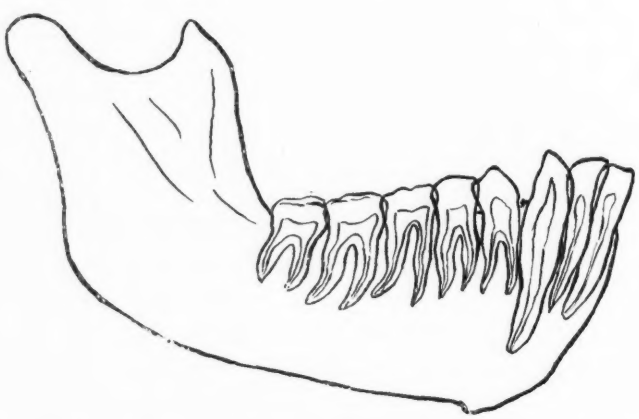


Fig. 2.—Tracing of radiogram of right half of mandible of adult orang, one-half natural size. Compare this with Fig. 1, and observe the tendency to divergence in the roots of the molars, the large size of the canine, the double roots of the premolars and the large size of the pulp chambers. In the orang the roots of all the teeth are of great length.

complish such a result in man. Although side to side movements are not prohibited by this method of occlusion, they are considerably limited in extent. In prosharmotic human jaws, lateral movements are not limited.

"Having now stated concerning the human and anthropoid dentitions those facts which are of importance in the present connection, we may pass on to consider the features apparent in the teeth of primitive man.

"Of races living at the present time, Melanesian, Australian and Eskimo peoples present the most primitive forms of teeth. In the incisors of the Negro, certainly, there is exhibited divergence of the lateral margins towards the cutting edge, a primitive feature resulting in a spatulate tooth. The crowns of all teeth are large in the Negro. But it is in this race that greatest

variation occurs throughout the body. Australian and Melanesian skulls display incisors of this type. The prosharmotic variety of occlusion or edge-to-edge bite is found typically in the crania of Australians and Greenlanders. In them, therefore, there is no limitation of lateral movements. Another primitive race, the North American Indian, shows large size of the third molar. In certain inhabitants of New Guinea there is a small but distinct diastema between the lateral incisor and the canine of the maxilla for the accommodation of the lower canine. But the Eskimo is of greatest use to us in linking up the teeth of modern races with those of paleolithic man. In the Eskimo the teeth are of large dimensions; the third molar is not smaller than the second; the necks of the teeth are not much reduced in diameter from the crowns, but the roots disp'ay the most distinctive character, for they are short and stout and show a marked tendency to fusion. In these less civilized races the palate tends to be short and wide, a condition one would

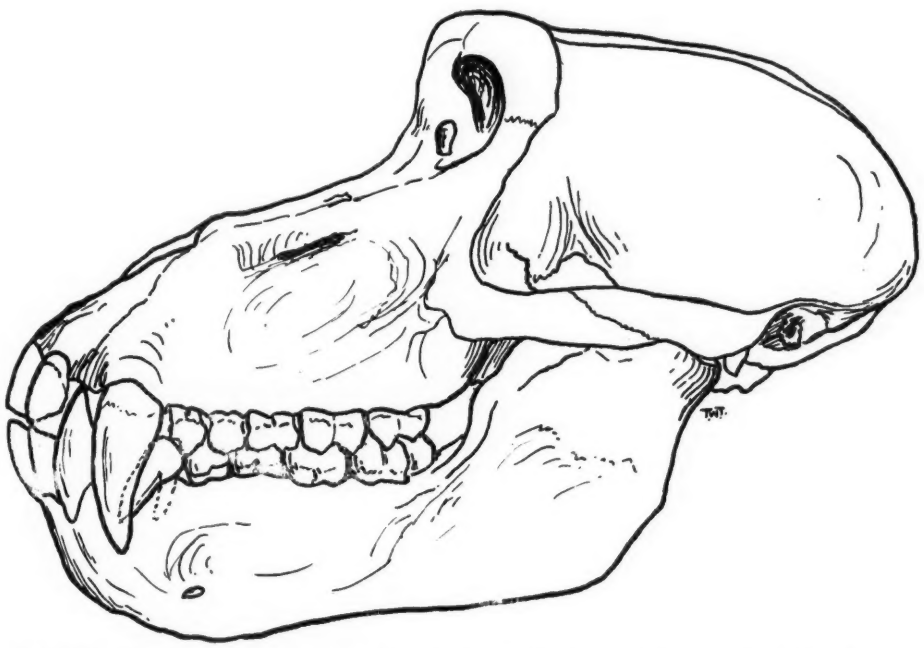


Fig. 3.—Left side of skull of adult baboon, two-thirds natural size. Although it is not an anthropoid, the baboon illustrates as well as the anthropoid the function of the canines in acting as dental guides.

anticipate from the possibility of unhampered lateral masticatory movements. In the modern European the enharmotic occlusion has led to narrowing and lengthening of the palate.

"The first paleolithic teeth to which our attention is directed are those of Homo Breladensis, the paleolithic man, or more possibly woman of Jersey. No skeletal remains of the individual were found, but thirteen teeth of the permanent dentition were removed from the floor of a cave on St. Brelade's Bay, together with flint implements of the Mousterian Culture and bones and teeth of the reindeer and the so-called woolly rhinoceros. Both implements and mammalian remains refer the period during which the individual lived to the latter part of the Pleistocene or Glacial era. Only the apices of the cusps of these teeth had been worn away, so that presumably the owner was not an old person.

"When the teeth are placed in their probable relative positions, Keith has determined that the hard palate would be 50 mm. in antero-posterior length and 68 mm. in breadth between the outer borders of the second molar teeth. The maxillary arcade must have been horse-shoe-shaped, and while in its length it is about the same as in modern man, in its lateral diameter its area greatly exceeded his. The lower dental arcade was 55 mm. long, 70 mm. broad and had an area of 3,200 sq. mm. The grinding surface of the lower molars must have exceeded in length that area in the case of modern man by some 10 mm., as in the case of the Heidelberg jaw shortly to be mentioned. On examination of the individual teeth, it is seen that the necks are but slightly less in diameter than the crowns, which are distinctly squarer in the case of the molars than in modern man. But the most outstanding feature is the short, stout character of the roots (most of which have lost their tips), and the fusion of the roots in those teeth which possess more than one. The canine, indeed, shows much more than the lateral grooving so often seen in ourselves, for its root is almost subdivided, though the radiogram makes it certain that only one pulp canal is present. The left maxillary second premolar has two fused roots, the left mandibular first premolar shows evidence of three fused roots, while the second premolar next it is very much reduced in size and had only a single grooved root.

Fig. 4.—Tracings from radiograms of the second mandibular molar tooth of Jersey man (A), one of the Krapina man (B), and Heidelberg man (C), one-half natural size Note the fusion of the roots and the large amount of secondary dentine diminishing the size of the pulp chamber in Jersey man. Some of the Krapina teeth show more fusion of roots than is exemplified in the specimen presented. The pulp chamber in the Krapina teeth is larger than that of the teeth in Heidelberg man. In all three cases the pulp chamber is of greater extent than is the case in modern man

"In respect of the relations between the first and second mandibular molars, this individual resembled the gorilla, but the dimensions of the teeth leave no doubt of its human character. The teeth, however, differ from those both of modern man and of the anthropoids in the marked fusion of the short, stout roots.

"The radiogram shows the pulp cavities to be partially filled with secondary dentine, a condition which appears with age and wear of the teeth. But these teeth show little wear, and may have been those of a young individual. It may be that the occurrence of secondary dentine in this specimen is associated with the great increase in cementum, which has caused fusion of the roots.

"Now let us glance for a moment at the teeth of Heidelberg man. They are of about the same dimensions as those of the Jersey example, that is to say, they present no marked difference in their crowns, whether in shape or cuspidation, from teeth of modern living man. The length of the arcade is, however, 60 mm., the breadth 72 mm., and the area 3,470 sq. mm., which measurements are greatly in advance of the corresponding ones in modern man. The mandible has many anthropoid features and, as in Jersey man, the first premolar is much larger than the second. Nevertheless the dimen-

sions of the teeth and their characteristics are distinctly human. The Heidelberg jaw was found in the same deposit with eoliths and with bones of *Rhinoceros etruscus*. These accompanying specimens indicate the era in which Heidelberg man lived to be older than that of the deposit of St. Brelade's Bay. Moreover, although the teeth of Heidelberg man are more worn, less secondary dentine is present in them than in those of the Jersey example. The roots of the teeth show a similiar, though not so marked, fusion.

"The year before the Heidelberg jaw came to light, Professor Gorjanovic-Kramberger described a number of teeth which, with fragments of human bones and those of the broad-nosed rhinoceros (*R. megarhinus*), were found near Krapina in Croatia. The extinct mammal suggests that the Krapina relics are older than those of St. Brelade's Bay, but not so old as the Heidelberg jaw. Some of the teeth are bigger than those of Heidelberg man, and although they do not display secondary dentine, as do those of St. Brelade's Bay, yet many of the molars have roots fused throughout their whole extent. Other features of the Krapina teeth are the following: The canines are reduced and have short roots which do not project sufficiently to produce a

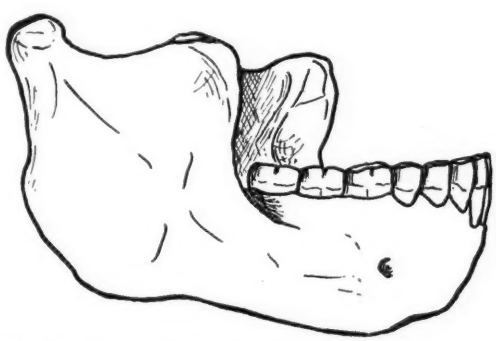


Fig. 5.—Right side of Heidelberg (Mauer) mandible, one-half natural size. Note the extensive dental arcade, the reduced canine and first premolar, the large size of the third molar, and the absence of a "waist" at the neck of the teeth.

caniniform fossa on the maxilla. The canines, moreover, display a certain curvature. The secondary maxillary premolar displays two roots.

"All teeth so far mentioned have certainly belonged to species of man now extinct, known as Homo primigenius or neandertalensis, of which Heidelberg man was probably a forerunner, and it is to be observed that they could not possibly be mistaken for those of modern man or of anthropoids. According to certain investigators, Heidelberg man lived during the first interglacial period, Krapina man during the second. If we are to accept the most careful estimates for the associated implements and remains, we must place Jersey man in the last interglacial phase or even during the fourth glaciation.

"The specific features which we have discerned in Homo primigenius are then that his teeth differ from ours not in size or shape or cuspidation, but in the method of fixation in the jaws, the prosharmotic occlusion, and the greater dimensions of the dental arcades. It may be inferred with some assurance that all these are related and are connected with a method of mastication in which lateral movements were unhampered. We find confirmation of this hypothesis in the formation of his jaws and in our scanty evidence, through the presence of seeds in occasional skeletons, and in primitive stone instruments for grinding corn, of the gritty nature of his food.

"Leaving out of account, for lack of space, the teeth of the probable ancestors of modern man, which do not offer such marked differences from our own, we pass to consider other teeth which are not quite so easy to place, but the first of which probably belonged to a variety of Homo who possessed teeth very similar in some respects to the recently discovered Eoanthropus, and certainly did not belong to an individual of the Homo primigenius race.

"At Taubach in Saxe-Weimar two teeth were discovered along with bones of the straight-tusked elephant (*E. antiquus*) and the broad-nosed rhinoceros (*R. Merckii* or *megarhinus*), and described in 1895. The associated mammalian remains refer the geological horizon to the earlier half of the Pleistocene. The teeth are as old as those of Krapina, though probably not so old as the jaw of Heidelberg. The left first mandibular milk molar and the same tooth in the permanent dentition were found. Of these the latter presents no marked difference from modern teeth in its size and number of cusps It has two stout roots parallel in direction and partially fused. In these particulars it is similar to teeth of Homo primigenius. Its crown is so long (mesio-distally) and so narrow (labio-lingually), however, that in this respect

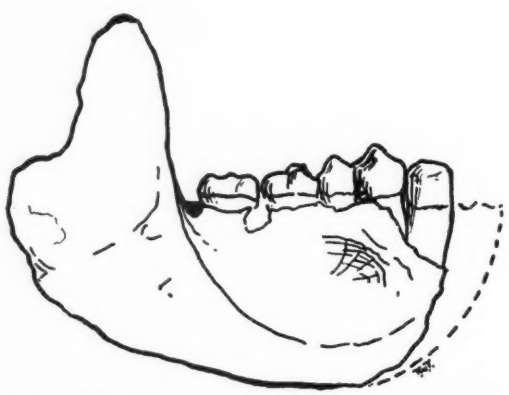


Fig. 6.—Fragment of the right side of the mandible of Dryopithecus, two-thirds natural size. Note the large canine, the greater size of the first premolar over the second, and the anthropoid-like first and second molars.

it is almost simian in type, and is indeed the tooth most nearly approaching the simian among those found in Europe.

"The next teeth to receive notice were discovered in Java along with a skull cap and a femur belonging to a creature to which the name Pithecanthropus has been given. The teeth are the maxillary second left and third right molars and the mandibular second premolar. They are too small to harmonize with the skull-cap, if it is that of an ape, and somewhat too large, if it is that of a human being. But we shall confine our attention to the teeth alone. The only anthropoid of sufficient size to have possessed the teeth, and now living in that region of the world, is the orang, but as he possesses exceptionally long roots to his teeth, this ape is at once disqualified from ownership. Otherwise the small neck and divergent unfused roots of the teeth correspond to the anthropoid dentition. The greater diameter of the crowns, which are rounded, is, however, in the labio-lingual direction. These features approximate to the human type, and the short, stout roots resemble those of the primitive Homo primigenius. The teeth resemble the

anthropoid dentition in certain features and the human in others. Yet they are not exactly like any teeth, for they have short, bulky crowns, the masticating surface of which is not nearly so great as the largest diameter of the crown itself. We must, therefore, regard the zoological position of these teeth as inconclusive. They appear to represent a stage between the anthropoid and man. From associated mammalian remains, Pithecanthropus probably lived at the commencement of the Pleistocene and is therefore older than Heidelberg man.

"Is it possible to go further back in this effort to trace our ancestral line by its teeth? If no human remains have been found of date earlier than those already mentioned, what animal was responsible for the eoliths of the Pliocene and the Miocene periods, always supposing these eoliths to be purposely chipped and not simply nature's artefacts? In a previous number of this journal ("Our Primate Ancestors," April, 1914), I discussed the characters of Dryopithecus, an extinct anthropoid which lived in France during the Miocene period. While he resembled the gorilla in the large size of his first mandibular premolar, he shared this feature in common with Heidelberg man and Jersey woman. But his teeth and jaws are by nature anthropoid,

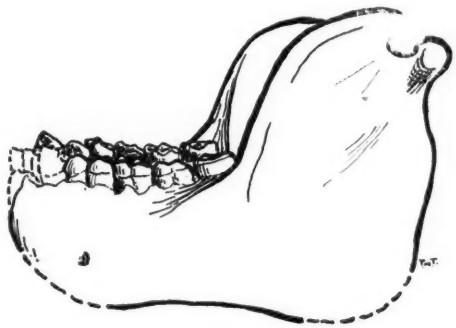


Fig. 7.—Left side of the mandible of Propliopithecus, natural size. Observe the vertical position of the incisors, the reduced canine, the short perpendicular premolars, and the anthropoid-like molars.

save in this and in the fact that his canines were not markedly prominent. We have been told that the gorilla uses a broken bough as a weapon, and that the chimpanzee bangs with a stick on a log at the pow-wows he attends, and it may be that a form like Dryopithecus could understand sufficient to enable him to rudely chip flints into implements.

"One last thought arises in our mind in connection with teeth. When did the distinctively human dentition appear in the world's history, the reduction in size of the canines and vertical position of the incisors? For this we must go back to the Oligocene, a period so remote that we can barely conceive its distance from us now. There lived, then, an animal, Propliopithecus by name, in which our human teeth are certainly foreshadowed. But this is long before our present anthropoids, or even Dryopithecus, so long extinct, became specialized, and countless ages before man, as we have seen him in his earliest form, appeared upon the face of the globe."

Resection of the Bone for Protrusion of the Mandible.

Resection of the bone for protrusion of the mandible, considered by many a rather heroic undertaking, is a subject which in the past has aroused no small amount of discussion. A case is reported by Thomas L. Gilmer, M.D., of Chicago, in *Surgery, Gynecology and Obstetrics*, May, 1915. Gilmer says:

"Operations for shortening the mandible have been successfully performed by Babcock of Philadelphia, Blair of St. Louis, Harsha of Chicago, and others, and to these surgeons I am indebted.

Protrusion of the mandible may be apparent or real. If there is lack of development, antero-posteriorly of the maxillæ, then, though the mandible be normal in length, it may apparently be too long.

"In the case I am presenting for your consideration there was over-development of the mandible and an under-development of the maxillæ. On account of the under-development of the maxillæ, to have secured a more normal occlusion of the teeth it would have been necessary to have shortened the lower jaw to an extent which I believed would not have been justifiable, since it would have destroyed the symmetry which should exist between the forehead, nose, and chin.

"In this case sections were removed on each side of the mandible at the angle. This site was chosen that I might with greater certainty be able to do a submucous operation, there being a greater thickness of the overlying soft tissues in the oral cavity in this locality than farther forward. Opening into the oral cavity is, of course, to be avoided if possible. On the right side an incision at the lower border of the mandible, one and one-half inches in length, was made through the soft tissues backward from the facial artery, the skin being drawn outward while the incision was being made, in order that the scar might rest under the jaw in the shadow line. The soft tissues overlying the periosteum were dissected upward on both the outer and inner surfaces of the mandible, the periosteum being undisturbed in its relation to the bone. The bone on the opposite side of the jaw was exposed in the same manner. The soft tissues on the outer surface of the jaw with the parotid were retracted upward and backward, those on the lingual side toward the median line. The size and shape of the segments of bone to be removed and been previously determined by Dr. Joseph Eisenstaedt, by mathematical calculation. Two incisions were made in the bone with a circular saw, the cuts extending two-thirds the distance from the base of the jaw at the angle upward; the distance between the incisions representing the shortening and change in the angle of the jaw, desired. This operation was duplicated on the opposite side of the mandible. Since it is easier to drill the holes in the bone before its complete separation, they were now drilled to receive the heavy immobilizing wires, and the wires inserted in the holes. With rongeur and chisels the remaining uncut portion of the segments of the bone on each side were now removed.

"Bands connected by bars had previously been cemented to the teeth on both sides, above and below, by Dr. Eisenstaedt. The teeth were now occluded and held in occlusion by wires lashing the lower to the upper bars. The ends of the heavy wires previously passed through the bones were now

twisted together, bent down, cut off, and smoothed. This drew the ends of the bones in close apposition. The soft parts were replaced and properly sutured. A small drain of gutta percha tissue was placed in each wound, and dressings applied. Two upper incisor teeth were missing, therefore danger from emesis was slight. The mandible was immobilized for six weeks, when the fixation apparatus on the teeth was removed. The recovery was prompt and uneventful.

"It is well known that function is soon restored after resection of the peripheral branches of the fifth nerve in the treatment of trifacial neuralgia. In experimental operations on dogs, I have found that even when all of the third branch of the fifth nerve was removed from the inferior dental canal,

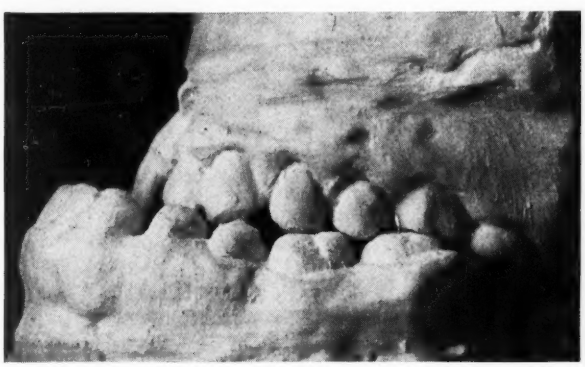


Fig. 1.—Casts made before operation showing relation of mandible to maxilla.

Fig. 2.—Casts made after operation showing new relation of mandible to maxilla.

it was completely restored in a few months' time and the pulps of the teeth showed no histological changes. Therefore, as time is an important factor in resection of the mandible, no attempt was made in this case to save the dental nerve intact. It is less than five months since the operation was performed, and nerve function is already practically restored."

Discussion.

"*Dr. Joseph Eisenstaedt:* This is the second case for which I have calculated the size and form of the bone segment for the resection of the jaw in prognathism. By way of explanation, it should be said that the etiology of this deformity may be traced to the premature loss of all the six-year

molars; furthermore, that the calculation necessarily was based upon the position of the twelve-year molar, which had approximately assumed the position of the six-year molar by anterior movement through the alveolar process.

"The basis for calculation in determining the amount and form of the bone segment is dependent upon two facts: First, the principle of normal occlusion. This may be defined as the normal antero-posterior relationship of the upper and lower six-year molars when they are in articulation or occlusion, as the latter is called by dental surgeons and orthodontists. The anatomical relationship more specifically requires that the anterior buccal cusp of the upper six-year molar lie within the buccal groove of the lower six-year molar when these teeth are in occlusion. Therefore, it may be said that the symmetry of the jaws and the relations of the alveolar processes

Fig. 3.—Photograph before operation. Fig. 4.—Photograph after operation.

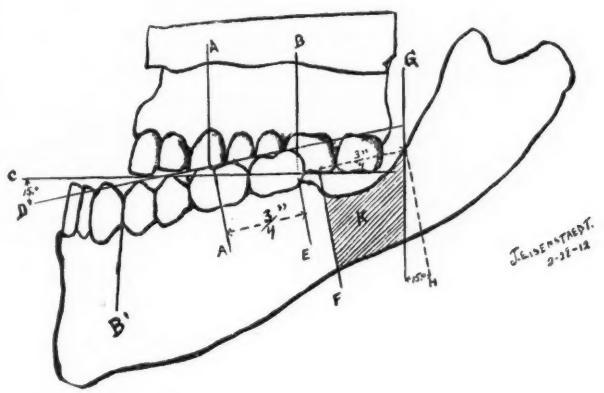
are in perfect harmony when the six-year molars have the antero-posterior relationship.

"The second fact precludes that the plane formed by the occluding surfaces of the lower posterior teeth is perpendicular to a line drawn through the long axis of the ramus; that is to say, the inclination of the angle of the jaw in an adult is approximately 90 to 100 degrees, or a right angle. It was determined with a millimeter gauge that the lower twelve-year molar protruded one-half an inch beyond the upper twelve-year molar. This distance was used as the superior dimension of the bone segment, or it may be said, determined the width antero-posteriorly of the superior border of the segment. From the outline of the mandible revealed in the radiogram, it was approximately estimated that the angle of the jaw had an inclination of 120 to 125 degrees.

"It is necessary to state further that by the establishment of definite planes, which correspond in the first place to the occluding surfaces of the lower posterior teeth, and in the second to the long axis of the ramus, we

have guides for constructing a right triangle. Accordingly a line was drawn through the long axis of the lower twelve year molar perpendicular to the occluding surfaces of the lower teeth. A second line was drawn parallel and representing the occluding planes of the lower posterior teeth, extending through the ramus. A third line was drawn one-fourth of an inch posterior to the posterior root of the last molar, parallel to the long axis of the twelve-year molar, and perpendicular to the first line, or that one representing the occluding plane of the teeth. This was established to insure a sufficient amount of bone to receive the silver wire loop passed through the tissue for approximating the fragments, and to avoid any pressure upon the peridental membrane of the last tooth. The fourth line was drawn through the long axis of the ramus, and determined the inclination of the posterior border of the bone segment.

"We have thus established three borders for the bone segment: The anterior border represented by the perpendicular line drawn through the body of the mandible, which is located one-fourth inch posterior to the root of the last tooth, and also perpendicular to the occluding plane of the lower



View of left side—level with occlusal plane, i. e., line "D"—showing form and superior dimension of bone segment calculated from the difference between the occlusal planes of the upper and lower bicuspids and molars.

posterior teeth. The second line established the plane of the superior border of the bone segment, that is to say, the line drawn continuous with the occluding plane, which extended transversely through the ramus. (A clearer understanding of the outline and form of the segment may be learned from the accompanying illustration.)

"Accordingly, after the bone segment had been removed, a definite relationship was established between the upper and lower posterior teeth, as well as a normal inclination given to the angle of the jaw.

"*Dr. William M. Harsha:* In the case reported, I congratulate Dr. Gilmer on the result of the operation. In May, 1911, I did the first operation of this particular kind so far as I have been able to learn. The cases are not common, and I have seen but one since. Prognathism, affecting both upper and lower jaws, is found in some of the lower races. Professor Starr, of the University of Chicago, showed me from his collection one of a Mexical girl showing the true type with perfect occlusion. Affecting the lower jaw, it is not considered a reversion of type, but a developmental error, with prob-

ably an heretidary influence. My patient had a younger brother with the same type of mandible, but in less degree. In my case the third molar was absent, and the mandible was lacking in the proper angle. The malocclusion resulted in narrowing of the upper jaw. The lower incisors projected five-eighths inch beyond the upper teeth. The absence of the third molars and the extra length of the mandible gave room for excision, and at the same time enabled us to form a proper angle by making the segment removed wedge-shape. The site of operation in Dr. Gilmer's case, and in the one I reported three years ago, is unquestionably better than in any operation previously done because of its accessibility. If a molar is in the way, it can be extracted and healing allowed to take place, and then the operation can be done without penetrating the mouth cavity. The scar can be placed under the jaw."

Work of Dentists in the Field.

Dentists were supplied to the German military hospitals from the beginning of the war, and their work was found so useful that it was deemed wise to increase their number and call on the students of dentistry to practice dental work and summon them from the troops among which they had been distributed. Besides this, the physicians were given a corresponding number of technicians skilled in making dental prostheses. This is the main part of the work on the firing line, as there are so many wounds of the jaws; but in the set camps and occupied towns, the care of the teeth and mouth is predominant. More frequently than in peace the officers and men break their artificial teeth. The constant moving about, the lack of any safe place to keep them and the demands on the teeth from the coarser food renders repairs frequent and necessary. At first there was a deficiency in materials for artificial teeth; this was remedied to a slight extent by the supplies found in the dental offices in the enemy's country. Conditions are better now. On certain days some of the dentists from the base hospitals go to the front to undertake the necessary dental operations on the different bodies of troops. The drill and the set of instruments are carried on a motor truck and with the expert prosthesis maker, the dentist tours away. He generally has to cover from 12 to 20 kilometers before he reaches the part of the troop to which he has been directed.

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EDITORIALS

Selective Orthodontia.

ORTHODONTIA has been defined as that science which has for its object the correction of malocclusion of the teeth. "Selective orthodontia" may be defined as that branch wherein certain practitioners only treat those cases that are capable of being carried to a successful termination or those cases in which they can produce what they call "ideal results." We find in the practice of orthodontia a great many men who have reached the stage where they "select patients", either because the patient pays a "select fee" or because the case is one which can be easily treated and an ideal result obtained in a short time. This leaves untreated a large number of cases, one class of which includes those who are financially unable to pay the fees which certain practitioners demand for orthodontic services. We agree that it is impossible to set a price as to what any man shall charge for his services or what shall be the limit at which he should take cases. Some are able to control a clientele which will pay large fees, others may serve that class of patients who will pay only small fees. Still there remains a large number of patients requiring orthodontic services, who cannot pay a reasonable fee to enable them to have their work done in private practice and there-

fore must be treated in clinics. However, there is another class of patients, namely, those presenting malocclusions which render an ideal result impossible, who have trouble in obtaining orthodontic services. We have seen many cases of malocclusion, some of which have been the result of neglect, some the result of bad dentistry (the extraction of teeth and improper filling), some the result of neglected nose and throat work, and still others the result of congenital conditions; all of which presented cases of malocclusion that demanded some sort of treatment and all presented conditions which prohibited the obtaining of an ideal result. A great many of these patients can pay for the services rendered, they can pay a good fee; yet, we find men who claim to be specialists in orthodontia refusing to treat such patients because they cannot get an ideal result. From the humanitarian standpoint, such an attitude is certainly not proper.

We also know that there are certain surgeons who refuse to operate on patients unless there are nine chances favorable to the life of the patient to one of his death. We even know surgeons who refuse to take an equal chance. If the patient has a fifty per cent chance for recovery from the disease against a fifty per cent chance of death, since the surgeons do not wish to have the death of the patient credited to them, they refuse to operate and give the patient the advantage of the few chances he has still remaining. Certainly the most important thing to consider is the benefit the patient is to derive, either from a surgical operation or from orthodontic treatment. In surgery, if a patient has one chance in ten to recover, the surgeon should give him the advantage of that one chance. If orthodontic treatment will improve the occlusion of the teeth, if it will improve a facial deformity even though the result will not be ideal—even though normal occlusion is not established; most assuredly the orthodontist should treat that case.

Unfortunately we find many practitioners who make the statement that they do not care to injure their reputation by treating a case which will not be absolutely satisfactory, or, in other words, absolutely ideal in result. They do not care to treat a case, the treatment of which will extend over a period of time more than the average, because they believe they can "sell their services" for more by treating a number of cases than by treating one bad case. We know this condition exists among orthodontists because we have seen it occur a great many times, and we have also seen cases treated in which the patient was very well pleased with results after treatment had been refused by other men because of the age of the patient or because of the extreme condition of the malocclusion. A general practitioner of dentistry is not supposed to attempt to treat extreme cases of malocclusion, but it is a known fact that cases have been referred to specialists and they have refused to treat them because the malocclusions were extreme. In other words, a condition has arisen wherein the specialist desires to treat the simple cases and if possible avoid the extreme cases. It should be just the other way. A specialist is the only one qualified to treat extreme cases; on the other hand a great many simple cases can be successfully treated by the general practitioner because of the small amount of skill required. If practicing orthodontia as a specialty is not going to enable men to successfully treat extreme cases, either as regards to the deformity, general conditions, or the age of the patient, then something should be done to improve this state of

affairs. Those who have the best interests of their profession at heart are certainly not in favor of "selective orthodontia" in the sense above described, but believe people with extreme malocclusions are entitled to some consideration, and if the specialist does not give them that consideration and the specialist does not treat such cases, who is going to treat them? Many of us have seen extreme cases of malocclusion which have been greatly benefited by treatment, the patient has been greatly benefited and has been very appreciative, although the results have not been absolutely ideal; but the improvement has been marked, the facial outline of the patient has been changed and the general health has been improved, and because of such results we believe that the day of "selective orthodontia" is past.

A Communication from France.

A COMMUNICATION comes from Dr. D. O. M. Le Cron, formerly of St. Louis, but now of the American Hospital of Paris, in which is described briefly conditions existing there and the experience he is having in the treatment of fractures and dislocations. Le Cron, under date of June 6, 1915, says:

Paris, June 6, 1915.

You will note by the above heading that I am connected with this Hospital doing work for humanity and giving my little mite toward relieving the poor suffering French soldiers.

We put in long hours from 8 A. M. to 6 P. M. seven days in the week—not much play I assure you. We are all giving our service free and pay our own expenses. I feel I am contributing my pro rata in service rendered if not in cold cash.

They are trying to get Robert to come over and take my place as I can't afford to help them any longer; and they say it is difficult to get men that can conceive ideas to make appliances for fractured and horrible shattered jaws and construct them.

Dr. W. C. Roberts of London and I work together and we have had since here 29 cases for fractures and torn out jaws; in two cases the whole chin was torn away. It is remarkable what restorations we can make, and, let me say, the general surgeons here surely appreciate our work and give us due credit for same. This dental department that was started by Dr. Geo. Hayes and Dr. Wm. Davenport, of this city, will surely make much new history for dentistry and certainly make the M. D's step down and note that dentistry is an honorable and great profession.

Dr. Hayes gives his whole time and Dr. Davenport seven half-days a week. They devoted their time since last September and shall continue the good work 'till the completion of the war.

They started with one chair—we now have six chairs and are now prepared to put in four to six more to meet the demands of the wounded that are coming in every day. We not only receive them from our hospital but ten other hospitals from this city have made application to send jaw cases to our department.

That alone is an open testimonial that our work in the dental department is becoming quite well known and the surgeons of the French hospitals are recognizing our department for its good work.

I have written Dr. Don Gallie and Dr. Burkhardt and made an appeal for the profession of America to contribute their mite in money to help our department. We get a small pro rata of the general fund but so little that we are all obliged to go down in our pockets, besides giving our service and expense, free to meet the demand.

It is too much to ask from Dr. Hayes, Dr. Davenport, and others who are giving their service, also to contribute money to run the department. It takes quite a lot of money and they are obliged to depend on contributions from some source. All money from dentists should be for the Dental Department. If sent to the American Red Cross Society but little good will it do for the Dental Profession.

Here you see the real horrors of this great war and you on that side of the pond can't realize the destruction.

This city once termed "Gay Parrie", now can aptly be termed the City of Mourning. Poor bleeding France with its many mutilated young men, sad-faced women in mourning and fatherless children, makes one's heart sick.

Today France has over three million of her young men at the front and over two million more in the field drilling and preparing to go to the front at their country's call to fill the vacant places of veterans that are slaughtered in this hellish war.

—*D. O. M. Le Cron.*

Pathology and Bacteriology for Dental Students.—By *Guthrie McConnell, M.D.*, Assistant Surgeon, Medical Reserve Corps, U. S. N. 12mo. of 309 pp. with 108 illustrations. W. B. Saunders Company, Philadelphia. Price, net, $2.25.

This book is designed for the need of the dental student and deals with the subject of general pathology and bacteriology. The first chapter covers the field of pathology in a general way, dealing with etiology of disease and certain exciting and predisposing causes which may be of interest to the dental practitioner. Chapter II deals with Disorders of Metabolism, in a very thorough manner. A great many conditions are described, some of which are important to the dental student and some of which are not. Very little is said upon the subject of rickets, one pathological condition to which dentists should pay more attention than they have in the past. The Disorders of Circulation are very thoroughly treated and the different degrees of inflammation carefully considered. In fact, the field of general pathology is very well covered and there is a brief description of most of the pathological conditions which are taken up in larger works. In the description of syphilis, it is very pleasing to note that the term "congenital syphilis" is used in preference to the old term "hereditary syphilis," for with our present knowledge of syphilis there can be no such thing as "inherited syphilis."

Tumors are very well classified and very well described and in fact they are considered in a very thorough manner. General bacteria is also covered, as are also the classification of the different bacteria, different methods of disinfecting, specific micro-organisms, and the technic for staining bacteria.

This book should contain more in regard to the pathological conditions of the pulp and the peridental membrane, and more attention should have been paid to the bacteria of the mouth.

The book as a whole is one which covers the general subject of pathology and bacteriology very well, but does not enter very deeply into the field of special oral pathology. It was probably intended by the author that these subjects would be covered by another book dealing more particularly with pathological and bacteriological conditions of the oral cavity. The book is one which would be a very valuable addition to any library for the brief, concise and clear manner in which different pathological conditions are presented.